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ABSTRACT

This document contains vocational education program course standards for technology education programs in Florida. Standards are provided for a total of 32 exploratory courses, practical arts courses, and pretechnical programs offered at the secondary or postsecondary level. Each program course standard consists of a curriculum framework and student performance standards. Each curriculum framework includes four components: major concepts/content, laboratory activities, special notes, and intended outcomes. The student performance standards listed in each individual section are cross-referenced to the intended outcomes in that same section. Included among the areas/aspects of technology covered are the following: aerospace technology, construction technology, manufacturing technology, electricity/electronics, visual communications, home maintenance, power mechanics and energy, industrial skills, applied technology, applied electronics, digital electronics, drafting and design, power and transportation, materials and processes, production technology, technology systems, and technology education for exceptional students. (MN)

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VOCATIONAL EDUCATION PROGRAM COURSES STANDARDS

July, 1993

Technology Education

ED 361 581

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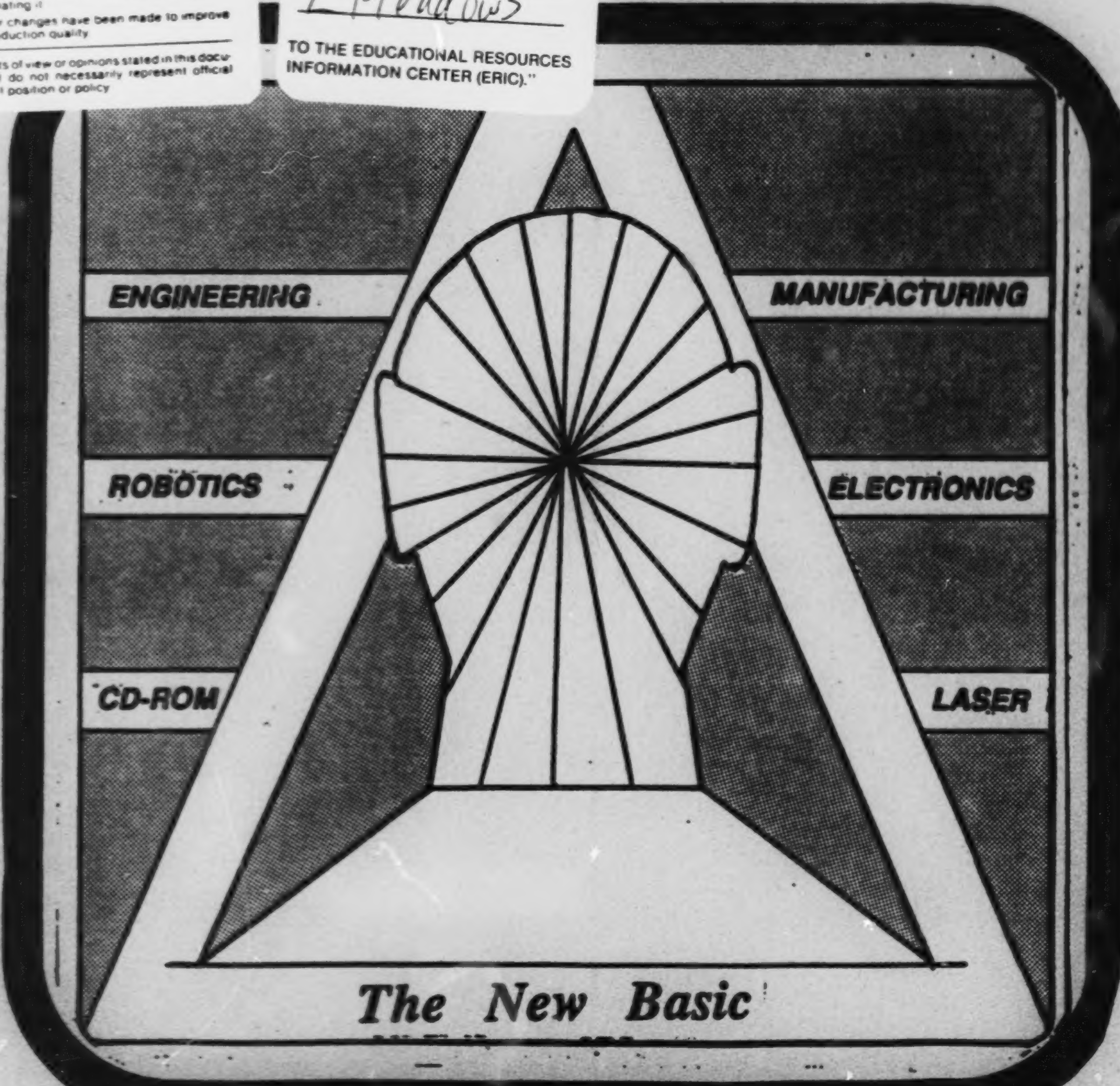
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VOCATIONAL EDUCATION
CURRICULUM FRAMEWORKS

TECHNOLOGY EDUCATION

July, 1993

FLORIDA DEPARTMENT OF EDUCATION
Division of Vocational, Adult, and Community Education
Bureau of Career Development and Educational Improvement
Education Improvement Services Section
Tallahassee, Florida 32399

(904) 487-2582

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FOREWORD

Section 228.041 Florida Statutes defines vocational education as consisting of four categories or types of instruction:

1. Exploratory courses designed to give students initial exposure to skills and attitudes associated with a broad range of occupations in order to assist them in making informed decisions regarding their future academic and occupational goals;

2. Practical arts courses designed to teach students practical generic skills which, though applicable to some occupations, are not designed to prepare students for entry into a specific occupation;

3. Job preparatory programs designed to provide students with the competencies necessary for effective entry into an occupation;

4. Supplemental courses designed to enable persons who are or have been employed in a specific occupation to upgrade their competencies in order to re-enter or maintain stability or advance within their occupations.

This document contains vocational education program courses standards (curriculum frameworks and student performance standards) for exploratory courses, practical arts courses and pretechnical programs offered at the secondary or postsecondary level as a part of Florida's comprehensive vocational education program. Vocational education program courses standards are established pursuant to Section 233.0682, Section 240.355, Section 233.011, and Section 232.2454, Florida Statutes, for school districts and community colleges. State Board of Education Rule 6A-6.0571, Criteria for Qualification for Special Vocational-Technical Education Program Courses, provides the basis for the development and dissemination of this document.

Each program courses standard is composed of two parts: a curriculum framework and student performance standards. The curriculum framework includes four major sections: major concepts/content, laboratory activities, special notes, and intended outcomes. Student performance standards are listed for each intended outcome. For secondary programs, courses have been designated with student performance standards listed for each course.

The standards do not prescribe how instruction should be delivered since decisions relative to the delivery of instruction must be made by school districts and community colleges within the context of local conditions. The Division of Vocational, Adult, and Community Education, Florida Department of Education, supports the belief that competency-based vocational education is the most effective means of providing programs and courses that conform to these established standards.

Program and course standards are based upon competencies required for entry, advancement, and upgrading in occupations in the vocational program areas of Agriculture, Business, Diversified, Health Occupations, Home Economics, Technology Education, Industrial, Marketing, and Public Service Education. Standards of courses designed for handicapped, disadvantaged, and other special needs persons are also provided. These standards are reviewed annually and revised as needed based upon changes in occupations utilizing input from business and industry employers, licensing and credentialing agencies, professional associations, state technical committees, and other representatives of the private sector.

TECHNOLOGY EDUCATION

Rapid advances in technology are forcing changes in educational content and methodology and are pointing out the necessity for preparing students who need to be technologically literate and ready for the future. We are in the midst of a technology explosion that will continue into the 21st century. It is altering our lifestyle and, of course, our work style. Citizens of Florida must understand technology as an integral part of our everyday lives. That is why teaching about technology and its impact on all of us is of vital importance at all grade levels in our schools. It is a fundamental study for all persons, regardless of educational or career goal.

Technology Education is responding to the realities of a new age that requires students to be prepared with universally transferrable technological skills for life and success in a modern world. It is an educational program that teaches students how to survive in an economy that needs, uses, and rewards an array of human talents much wider than the narrower academic and occupational skills that are traditionally taught. Technology Education provides a setting to strategically teach essential skills. It is a logical link in the educational process that treats both academic and vocational skills in a theoretical and applied way. Students are provided optimum experiences, both abstract and concrete, through the applied study of technological tools, materials, systems, and processes. This is a type of learning that allows students to make sense out of their world and provides the correct balance of depth and breadth to enable them to deal with a world of dazzling change and complexity. Students in Technology Education learn to apply problem-solving skills to the solution of community, industry, life problems, and technological issues facing Florida. They develop an attitude that learning is a lifelong process. They recognize the consequences of technology on the individual and society. The end result is a new educational essential called technological literacy. It not only enables our youth to be technologically informed, but to also have technological understanding. It enables our youth to be technologically wise, as well as technologically smart.

The program of Technology Education is organized around, but not limited to, the technological categories of drafting, electronics communications, construction, manufacturing, production, energy, power, transportation, aerospace, engineering, and supporting content areas. Applied learning activities are conducted in a laboratory setting with a minimuim of 75 percent hands-on experiences with technological tools, machines, instruments, materials, processes, and systems.

Consistent with individual abilities, interests, and needs, the student will:

1. Establish a knowledge and appreciation for the importance of technology.
2. Apply technological tools, machines, instruments, materials, processes, and systems safely and effectively.
3. Develop the skills, creative abilities, positive self-concepts, and individual capabilities to use a variety of technologies.
4. Develop problem-solving and decision-making abilities using technical means.
5. Apply other school subjects appropriate to technology content, instruction, and laboratory activities.
6. Understand technology as a base for career opportunities.
7. Uncover and develop individual talents and interests.
8. Adjust to a changing environment.
9. Become a wiser consumer.
10. Develop a positive attitude toward lifelong learning.
11. Deal with forces that influence the future.
12. Demonstrate an understanding of entrepreneurship.
13. Demonstrate positive human relations, leadership skills, organizational abilities, and technological literacy through participation in the Florida Technology Student Association (FL-TSA).

CURRICULUM FRAMEWORK   PROGRAM AREA: Technology Education

FLORIDA DEPARTMENT OF EDUCATION   EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Introduction to Technology

CODE NUMBER: Secondary 8600270   Postsecondary ________

Florida CIP 0821.0120EX

SECONDARY
SCHOOL CREDITS 0.5   COLLEGE CREDITS ____   POSTSECONDARY ADULT
VOCATIONAL CREDITS __

APPLICABLE LEVEL (S): _X_ 6-9   ___ 9-12   ___ Postsecondary Adult Vocational

___ Postsecondary Vocational   _X_ Other 30, 31

CERTIFICATION COVERAGE: I ART-TEC 1 0 2   IND ARTS 0 4 0 6

I. MAJOR CONCEPTS/CONTENT: The purpose of this course is to introduce students to the world of technology, resulting in an increased understanding of technology, its development, and its use. Laboratory experiences revolving around the physical, information, and biological technologies will allow students to explore their technological world. Through "hands-on" activities, students will develop technological literacy, apply basic skills, and increase their self-awareness.

The content includes, but is not limited to, the history, resources, impacts, and systems of technology, and problem solving.

II. LABORATORY ACTIVITIES: Instruction and learning activities are provided in a laboratory setting using hands-on exploratory experiences with the tools and materials related to the content.

III. SPECIAL NOTE: The emphasis of this course is on developing awareness of future needs, developing technological competence, confidence and awareness through interaction with technologies, developing awareness of other vocational programs, interacting with business, industry and community organizations, applying basic skills in learning activities, and developing self-awareness of individual abilities, needs and interests. The course is intended to help students develop their problem-solving skills and creativity while learning about technology and careers. Students will learn to gather data through research and testing, as well as to record the results of their laboratory experiments.

The Florida Technology Student Association (FL-TSA) is the appropriate student organization for providing leadership training experiences and for reinforcing specific technology skills. When provided, these activities are considered an integral part of this course.

Proposed design code 240 as shown in DVACE joint Memorandum 92-37 of May 27, 1992, is appropriate for this course.

IV. INTENDED OUTCOMES: After successfully completing this course, the student will be able to:

01. Demonstrate proper and safe procedures while working with technological tools, apparatus, equipment, systems, and materials.
02. Exhibit positive human relations and leadership skills.
03. Demonstrate computer application and literacy.
04. Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.
05. Demonstrate and apply design/problem-solving processes.

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06. Demonstrate technological literacy.
07. Display an understanding and appreciation for the dignity and worth of honest labor.
08. Discuss individual interests and aptitudes as they relate to a career.
09. Develop the idea that technology is the application of knowledge to solve human problems and extend capabilities.
10. Describe positive and negative impacts of technology.
11. Identify resources of technology.
12. Utilize the systems approach in technology.
13. Utilize tools, machines, and equipment in the technology laboratory.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education COURSE NUMBER: 8600270

COURSE TITLE: Introduction to Technology

01.0 DEMONSTRATE PROPER AND SAFE PROCEDURES WHILE WORKING WITH TECHNOLOGICAL TOOLS, APPARATUS, EQUIPMENT, SYSTEMS, AND MATERIALS--
The student will be able to:

01.01 Follow laboratory safety rules and procedures.
01.02 Demonstrate good housekeeping at work station within total laboratory.
01.03 Conduct laboratory activities and equipment operations in a safe manner.
01.04 Exercise care and respect for all tools, equipment, and materials.
01.05 Identify color-coding safety standards.
01.06 Safely use hand tools and power equipment.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 EXHIBIT POSITIVE HUMAN RELATIONS AND LEADERSHIP SKILLS--
The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Work cooperatively with others.

03.0 DEMONSTRATE COMPUTER APPLICATION AND LITERACY--
The student will be able to:

03.01 Define terms related to computer parts usage.
03.02 List ways in which computers are used in technology.
03.03 Discuss advantages and disadvantages in the use of computers.
03.04 Demonstrate the application of a computer.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--
The student will be able to:

04.01 Use the features of books and reference materials, such as table of contents, preface, introduction, titles and subtitles, index, glossary, appendix, bibliography.
04.02 Read and follow written directions.
04.03 Find, understand, and apply information from a variety of sources (books, manuals, newspapers, periodicals, directories, reference works, computer printouts, and other printed matter or electronic sources such as video display terminals).
04.04 Use and expand general and specialized vocabulary (including abbreviations, acronyms, and concepts) as appropriate to subject areas studied at the grade level.
04.05 Write Standard English sentences with correct:
  -sentence structure;
  -verb forms;
  -punctuation, capitalization, possessives, plural forms, and other matters of mechanics;
  -word choice and spelling.
04.06 Answer and ask questions coherently and concisely, and follow spoken instructions.
04.07 Identify and comprehend the main and subordinate ideas in lectures and discussions, ask questions to clarify information heard, and report accurately what others have said.

04.08 Perform with accuracy the computations of addition, subtraction, multiplication, and division using natural numbers, fractions, decimals and integers.
04.09 Make and use measurements in both traditional and metric units.
04.10 Formulate and solve problems in mathematical terms, selecting appropriate approaches and tools (mental computation, trial and error, paper-and-pencil techniques, calculator, and computer).
04.11 Solve work-related problems involving the basic arithmetic operations using whole numbers, fractions, decimals, and percents.
04.12 Describe the role of observation and experimentation in the development of scientific theories.
04.13 Gather scientific information through skills in laboratory, field and library work.
04.14 Draw conclusions or make inferences from data.
04.15 Apply basic scientific/technical solutions to the appropriate problems.

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--

The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.

06.0 DEMONSTRATE TECHNOLOGICAL LITERACY--

The student will be able to:

06.01 Define technology
06.02 Outline major historical technological developments or events.
06.03 Identify recent advances in technology.
06.04 Explain problem-solving roles of technology.
06.05 Forecast a technological decision.
06.06 Make a technological decision.

07.0 DISPLAY AN UNDERSTANDING AND APPRECIATION FOR THE DIGNITY AND WORTH OF HONEST LABOR--

The student will be able to:

07.01 Form an understanding and appreciation for work after listening to or observing technology workers.
07.02 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
07.03 Form an understanding and appreciation for the roles and work of co-workers.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--

The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE THE USE OF TECHNOLOGICAL SYSTEMS IN PROCESSING RESOURCES-

The student will be able to:

09.01 Identify four types of materials conversion.
09.02 Identify the types, sources, and conversions of energy.
09.03 Identify the steps in processing information.
09.04 Construct a product using the materials conversion processes.
09.05 Construct a product that converts energy.
09.06 Use a computer to process information.

10.0 DESCRIBE POSITIVE AND NEGATIVE IMPACTS OF TECHNOLOGY--
The student will be able to:

10.01 Explain the term "impact".
10.02 Explain ways in which technology influences/affects his/her life and the environment.
10.03 Categorize impacts as "desirable" or "undesirable".
10.04 Suggest ways of minimizing undesirable impacts and protecting the environment.

11.0 IDENTIFY RESOURCES OF TECHNOLOGY--
The student will be able to:

11.01 Define the term "resource".
11.02 Identify major categories of resources of technology.
11.03 List specific examples of resources of technology.
11.04 Categorize examples of resources of technology.
11.05 Explain how technological development is dependent upon resources.
11.06 Utilize technological resources to produce a product.

12.0 UTILIZE THE SYSTEMS APPROACH IN TECHNOLOGY--
The student will be able to:

12.01 Define the term "system" as used in technology.
12.02 Identify and explain major components of a system.
12.03 Draw and label a basic system model.
12.04 Describe common examples of technological systems.
12.05 Construct and/or operate a simple technological system.

13.0 UTILIZE TOOLS, MACHINES, AND EQUIPMENT IN THE TECHNOLOGY LABORATORY--
The student will be able to:

13.01 Identify tools, machines, materials and equipment and describe their functions.
13.02 Select appropriate tools, machines, and equipment to accomplish a given task.
13.03 Demonstrate safe and correct use of tools, machines, and equipment.

CURRICULUM FRAMEWORK PROGRAM AREA: Technology Education

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

COURSE TITLE: Orientation to Technology

CODE NUMBER: Secondary 8600110 Postsecondary ______

Florida CIP 0821.0111OR

SECONDARY SCHOOL CREDITS .5 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): X 6-9 ______ 9-12 ______ Postsecondary Adult Vocational

______ Postsecondary Vocational X Other 30, 31

CERTIFICATION COVERAGE: INDUS ARTS @ 4 @ 6 METALS @ 4 I ART-TEC 1 @2
WOODWORK @ 4 GEN SHOP @ 4

I. MAJOR CONCEPTS/CONTENT: The purpose of this course is to orient students to the concepts that underlie technological systems and the influence of technological systems at home, school, and the world of work. Emphasis is placed on the fact that people must develop and control technology responsibly; also, that people have the capabilities to determine how technology can be applied to their benefit.

Laboratory activities revolving around traditional and modern technological tools, machines, and devices will provide students with "design and construct" experiences.

The content includes, but is not limited to, the study of technology with emphasis on its development and control, desirable and undesirable impacts, input-process-output systems model, and possibilities and limitations. Special skills, safety, and leadership are also included.

II. LABORATORY ACTIVITIES: Instruction and learning activities are provided in a laboratory setting using hands-on exploratory experiences with the tools and materials related to the content.

III. SPECIAL NOTE: The Florida Technology Student Association (FL-TSA) is the appropriate student organization for providing leadership training experiences and for reinforcing specific technology skills. When provided, these activities are considered an integral part of this instructional course.

Proposed design code 240 as shown in DVACE joint Memorandum 92-37 of May 27, 1992, is appropriate for this course.

IV. INTENDED OUTCOMES: After successfully completing this course, the student will be able to:

01. Demonstrate proper and safe procedures while working with technological tools, apparatus, equipment, systems and materials.
02. Exhibit positive human relations and leadership skills.
03. Demonstrate computer application and literacy.
04. Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.
05. Demonstrate and apply design/problem-solving processes.
06. Demonstrate technological literacy.
07. Display an understanding and appreciation for the dignity and worth of honest labor.
08. Discuss individual interests and aptitudes as they relate to a career.

09. Demonstrate the use of technological systems in processing resources.
10. Utilize various controls for technological systems.
11. Discuss the outputs of technology on society and the environment.
12. Select appropriate resources for technological decision making.
13. Identify kinds and levels of work common to technology.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education PROGRAM NUMBER: 8600110

COURSE TITLE: Orientation to Technology

01.0 DEMONSTRATE PROPER AND SAFE PROCEDURES WHILE WORKING WITH TECHNOLOGICAL TOOLS, APPARATUS, EQUIPMENT, SYSTEMS, AND MATERIALS--The student will be able to:

01.01 Follow laboratory safety rules and procedures.
01.02 Demonstrate good housekeeping at work station within total laboratory.
01.03 Conduct laboratory activities and equipment operations in a safe manner.
01.04 Exercise care and respect for all tools, equipment, and materials.
01.05 Identify color-coding safety standards.
01.06 Safely use hand tools and power equipment.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 EXHIBIT POSITIVE HUMAN RELATIONS AND LEADERSHIP SKILLS--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Work cooperatively with others.

03.0 DEMONSTRATE COMPUTER APPLICATION AND LITERACY--The student will be able to:

03.01 Define terms related to computer parts and usage.
03.02 List ways in which computer are used in technology.
03.03 Discuss advantages and disadvantages in the use of computers.
03.04 Demonstrate the application of a computer.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Use the features of books and reference materials, such as table of contents, preface, introduction, titles and subtitles, index, glossary, appendix, bibliography.
04.02 Read and follow complex written directions.
04.03 Find, understand, and apply information from a variety of sources (books, manuals, newspapers, periodicals, directories, reference works, computer printouts, and other printed matter or electronic sources such as video display terminals).
04.04 Use and expand general and specialized vocabulary (including abbreviations, acronyms, and concepts) as appropriate to subject areas studied at the grade level.
04.05 Write Standard English sentences with correct:
  - sentence structure;
  - verb forms;
  - punctuation, capitalization, possessives, plural forms, and other matters of mechanics;
  - word choice and spelling.
04.06 Answer and ask questions coherently and concisely, and follow spoken instructions.
04.07 Identify and comprehend the main and subordinate ideas in lectures and discussions, ask questions to clarify information heard, and report accurately what others have said.

04.08 Perform with accuracy the computations of addition, subtraction, multiplication, and division using natural numbers, fractions, decimals and integers.
04.09 Make and use measurements in both traditional and metric units.
04.10 Formulate and solve problems in mathematical terms, selecting appropriate approaches and tools (mental computation, trial and error, paper-and-pencil techniques, calculator, and computer).
04.11 Solve work-related problems involving the basic arithmetic operations using whole numbers, fractions, decimals, and percents.
04.12 Describe the role of observation and experimentation in the development of scientifc theories.
04.13 Gather scientific information through skills in laboratory, field and library work.
04.14 Draw conclusions or make inferences from data.
04.15 Apply basic scientific/technical solutions to the appropriate problems.

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.

06.0 DEMONSTRATE TECHNOLOGICAL LITERACY--
The student will be able to:

06.01 Outline major historical technological developments or events.
06.02 Identify recent advances in technology.
06.03 Explain problem-solving roles of technology.
06.04 Forecast a technological decision.
06.05 Make a technological decision.
06.06 Define technology.

07.0 DISPLAY AN UNDERSTANDING AND APPRECIATION FOR THE DIGNITY AND WORTH OF HONEST LABOR--
The student will be able to:

07.01 Form an understanding and appreciation for work after listening to or observing technology workers.
07.02 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
07.03 Form an understanding and appreciation for the roles and work of co-workers.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE THE USE OF TECHNOLOGICAL SYSTEMS IN PROCESSING RESOURCES-
The student will be able to:

09.01 Identify four types of materials conversion.
09.02 Identify the types, sources, and conversions of energy.
09.03 Identify the steps in processing information.
09.04 Construct a product using the materials conversion processes.
09.05 Construct a product that converts energy.
09.06 Use a computer to process information.

10.0 UTILIZE VARIOUS CONTROLS FOR TECHNOLOGICAL SYSTEMS--
The student will be able to:

10.01 Identify various control sub-systems.
10.02 Identify components of various control sub-systems.
10.03 Construct sub-system controls.
10.04 Demonstrate the use of sub-system controls.

11.0 DISCUSS THE OUTPUTS OF TECHNOLOGY ON SOCIETY AND THE ENVIRONMENT--
The student will be able to:

11.01 Discuss the outputs of technology, now and in the future.
11.02 Discuss the impacts of technology on work, job opportunities, and careers.
11.03 Identify the scope of technological impacts.
11.04 Identify means of controlling the world impacts of technology.
11.05 Discuss how technology can solve and/or create problems.
11.06 Discuss expected and unexpected outputs of technology.
11.07 Discuss desired and undesired outputs of technology.

12.0 SELECT APPROPRIATE RESOURCES FOR TECHNOLOGICAL DECISION MAKING--
The student will be able to:

12.01 Identify goals, processes available, constraints and limitations for utilizing the resources.
12.02 Discuss the optimization, compromises and trade-offs for wise use of resources.
12.03 Identify the properties of various materials.
12.04 Select appropriate computer software for graphics and special applications.

13.0 IDENTIFY KINDS AND LEVELS OF WORK COMMON TO TECHNOLOGY--
The student will be able to:

13.01 Identify kinds of work related to technology.
13.02 Identify semiskilled, skilled, and professional levels of work in technology.

CURRICULUM FRAMEWORK PROGRAM AREA: Technology Education

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Exploring Technology

CODE NUMBER: Secondary 8600260 Postsecondary ______

Florida CIP 0821.0119EX

SECONDARY SCHOOL CREDITS 0.5 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): X 6-9 ___ 9-12 X Postsecondary Adult Vocational

___ Postsecondary Vocational X Other 30, 31

CERTIFICATION COVERAGE: I ART-TEC 1 @ 2 IND ARTS @ 4 @ 6

I. MAJOR CONCEPTS/CONTENT: The purpose of this course is to introduce students to the kinds and levels of work performed in today's and our future technological world. Laboratory experiences revolving around electronics, computers, and the technology systems of communications, production, construction and transportation will allow students to explore the requisites and special skills for careers in our technological world. Laboratory experiences will acquaint students with the organization, functions, and evolving technologies in our technological world.

The content includes, but is not limited to, the study of our technological world with emphasis on organization, functions, occupations, special skills, safety, human relations, leadership, and evolving technologies.

II. LABORATORY ACTIVITIES: Instruction and learning activities are provided in a laboratory setting using hands-on exploratory experiences with the tools and materials related to the content.

III. SPECIAL NOTE: The Florida Technology Student Association (FL-TSA) is the appropriate student organization for providing leadership training experiences and for reinforcing specific technology skills. When provided, these activities are considered an integral part of the instructional course.

Proposed design code 240 as shown in DVACE joint Memorandum 92-37 of May 27, 1992, is appropriate for this course.

IV. INTENDED OUTCOMES: After successfully completing this course, the student will be able to:

01. Demonstrate proper and safe procedures while working with technological tools, apparatus, equipment, systems and materials.
02. Exhibit positive human relations and leadership skills.
03. Demonstrate computer application and literacy.
04. Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.
05. Demonstrate and apply design/problem-solving processes.
06. Demonstrate technological literacy.
07. Display an understanding and appreciation for the dignity and worth of honest labor.
08. Discuss individual interests and aptitudes as they relate to a career.
09. Identify evolving technologies in our technological world.

10. Perform special skills unique to electronics, computers, and the technology systems of communications, manufacturing, construction, energy, power, and transportation.
11. Express a knowledge of the essential elements and organization of the free enterprise system.
12. List requisites and employment opportunities for employment in today's and our future technological world.
13. Identify kinds and levels of work common to today's and our future technological world.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education SECONDARY NUMBER 8600260

COURSE TITLE: Exploring Technology

01.0 DEMONSTRATE PROPER AND SAFE PROCEDURES WHILE WORKING WITH TECHNOLOGICAL TOOLS, APPARATUS, EQUIPMENT, SYSTEMS, AND MATERIALS--The student will be able to:

01.01 Follow laboratory safety rules and procedures.
01.02 Demonstrate good housekeeping at work station within total laboratory.
01.03 Conduct laboratory activities and equipment operations in a safe manner.
01.04 Exercise care and respect for all tools, equipment, and materials.
01.05 Identify color-coding safety standards.
01.06 Safely use hand tools and power equipment.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 EXHIBIT POSITIVE HUMAN RELATIONS AND LEADERSHIP SKILLS--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Work cooperatively with others.

03.0 DEMONSTRATE COMPUTER APPLICATION AND LITERACY--The student will be able to:

03.01 Define terms related to computer parts and usage.
03.02 List ways in which computer are used in technology.
03.03 Discuss advantages and disadvantages in the use of computers.
03.04 Demonstrate the application of a computer.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Use the features of books and reference materials, such as table of contents, preface, introduction, titles and subtitles, index, glossary, appendix, bibliography.
04.02 Read and follow complex written directions.
04.03 Find, understand, and apply information from a variety of sources (books, manuals, newspapers, periodicals, directories, reference works, computer printouts, and other printed matter or electronic sources such as video display terminals).
04.04 Use and expand general and specialized vocabulary (including abbreviations, acronyms, and concepts) as appropriate to subject areas studied at the grade level.
04.05 Write Standard English sentences with correct:
 -sentence structure;
 -verb forms;
 -punctuation, capitalization, possessives, plural forms, and other matters of mechanics;
 -word choice and spelling.
04.06 Answer and ask questions coherently and concisely, and follow spoken instructions.
04.07 Identify and comprehend the main and subordinate ideas in lectures and discussions, ask questions to clarify information heard, and report accurately what others have said.

04.08 Perform with accuracy the computations of addition, subtraction, multiplication, and division using natural numbers, fractions, decimals and integers.
04.09 Make and use measurements in both traditional and metric units.
04.10 Formulate and solve problems in mathematical terms, selecting appropriate approaches and tools (mental computation, trial and error, paper-and-pencil techniques, calculator, and computer).
04.11 Solve work-related problems involving the basic arithmetic operations using whole numbers, fractions, decimals, and percents.
04.12 Describe the role of observation and experimentation in the development of scientifc theories.
04.13 Gather scientific information through skills in laboratory, field and library work.
04.14 Draw conclusions or make inferences from data.
04.15 Apply basic scientific/technical solutions to the appropriate problems.

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.

06.0 DEMONSTRATE TECHNOLOGICAL LITERACY--
The student will be able to:

06.01 Outline major historical technological developments or events.
06.02 Identify recent advances in technology.
06.03 Explain problem-solving roles of technology.
06.04 Forecast a technological decision.
06.05 Make a technological decision.
06.06 Define technology.

07.0 DISPLAY AN UNDERSTANDING AND APPRECIATION FOR THE DIGNITY AND WORTH OF HONEST LABOR--
The student will be able to:

07.01 Form an understanding and appreciation for work after listening to or observing technology workers.
07.02 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
07.03 Form an understanding and appreciation for the roles and work of co-workers.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 IDENTIFY EVOLVING TECHNOLOGIES IN OUR TECHNOLOGICAL WORLD--
The student will be able to:

09.01 List evolving technologies.
09.02 Report on a recent or evolving technology.

10.0 PERFORM SPECIAL SKILLS UNIQUE TO ELECTRONICS, COMPUTERS AND THE TECHNOLOGY SYSTEMS OF COMMUNICATIONS, CONSTRUCTION, MANUFACTURING, ENERGY, POWER, AND TRANSPORTATION--
The student will be able to:

10.01 Perform electronic technology laboratory activities.
    10.01.1 Define Electronic Systems.
    10.01.2 Conduct electronic systems experiments using input, process, and output.
10.02 Perform computer technology laboratory activities.
    10.02.1 Define Computer Technology.
    10.02.2 Conduct computer controlled experiments.
10.03 Perform special skills unique to communications operations.
    10.03.1 Perform basic drafting skills using traditional tools, instruments, and methods.
    10.03.2 Perform basic drafting skills using today's technology.
10.04 Perform construction technology laboratory activities.
    10.04.1 Perform basic construction skills using traditional tools, equipment and methods.
    10.04.2 Perform basic construction skills using today's technology of tools, equipment, and methods.
10.05 Perform special skills unique to manufacturing technology.
    10.05.1 Perform basic production skills using traditional tools, equipment, and methods.
    10.05.2 Perform basic production skills using today's technology of tools, equipment, and methods (CAD/CAM, CNC, Robots, Work Cell, etc.).
10.06 Perform special skills unique to energy, power, and transportation technology.
    10.06.1 Perform basic energy, power, and transportation skills using traditional tools, equipment and methods.
    10.06.2 Perform basic energy, power, and transportation skills using today's technology of tools, equipment and methods.

11.0 EXPRESS A KNOWLEDGE OF THE ESSENTIAL ELEMENTS AND ORGANIZATION OF THE FREE ENTERPRISE SYSTEM--
The student will be able to:

11.01 Outline the main functions of research and development, personnel management, production, quality control, and marketing.
11.02 Participate in a simulated technology organization incorporating the five above elements.

12.0 LIST REQUISITES AND EMPLOYMENT OPPORTUNITIES FOR EMPLOYMENT IN TODAY'S AND OUR FUTURE TECHNOLOGICAL WORLD--
The student will be able to:

12.01 List occupations, job requirements and employment opportunities in communications technology.
12.02 List occupations, job requirements and employment opportunities in construction technology.
12.03 List occupations, job requirements and employment opportunities in manufacturing technology.
12.04 List occupations, job requirements and employment opportunities in energy, power, and transportation technology.
12.05 List related occupations and academic courses available at the secondary and postsecondary levels.

13.0 IDENTIFY KINDS AND LEVELS OF WORK COMMON TO TECHNOLOGY--
The student will be able to:

13.01 Identify kinds of work as a technology craftsperson.
13.02 Identify kinds of work as a technology technician.
13.03 Identify kinds of work as a technology engineer or scientist.
13.04 Identify kinds of work in technology management.
13.05 Identify other kinds of technology work.

CURRICULUM FRAMEWORK PROGRAM AREA: Technology Education

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

COURSE TITLE: Exploration of Aerospace Technology

CODE NUMBER: Secondary 8600280 Postsecondary ______

Florida CIP 0821.0121EX

SECONDARY SCHOOL CREDIT: 0.5 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): __X__ 6-9 ____ 9-12 ____ Postsecondary Adult Vocational

____ Postsecondary Vocational __X__ Other 30, 31

CERTIFICATION COVERAGE: INDUS ARTS @ 4 @ 6 I ART-TEC 1 @ 2

I. MAJOR CONCEPTS/CONTENT: The purpose of this course is to provide an opportunity of students to explore significant aspects of aerospace technology. Laboratory experiences will allow students to explore the occupations, skills, processes and systems related to aerospace technologies.

The content includes, but is not limited to, the exploratory study of aerospace technology, occupations, skills, safety, human relations, and leadership.

II. LABORATORY ACTIVITIES: Instruction and learning activities are provided in a laboratory setting using hands-on exploratory experiences with the tools and materials appropriate to the course content.

III. SPECIAL NOTE: The Florida Technology Student Association (FL-TSA) is the appropriate student organization for providing leadership training experiences and for reinforcing specific technology skills. When provided, these activities are considered an integral part of this instructional course.

Proposed design code 240 as shown in DVACE joint Memorandum 92-37 of May 27, 1992, is appropriate for this course.

IV. INTENDED OUTCOMES: After successfully completing this course, the student will be able to:

01. Demonstrate proper and safe procedures while working with technological tools, apparatus, equipment, systems, and materials.
02. Exhibit positive human relations and leadership skills.
03. Demonstrate computer application and literacy.
04. Apply basic skills in communication, mathematics, and science appropriate to technological content and learning activities.
05. Demonstrate and apply design/problem-solving processes.
06. Demonstrate technological literacy.
07. Display an understanding and appreciation for the dignity and worth of honest labor.
08. Identify and discuss occupational and career interest areas in aviation and space technology.
09. Demonstrate knowledge of the basic principles of aerostatics and aerodynamics.
10. Identify and demonstrate knowledge of both liquid and solid propellent rocket propulsion systems.
11. Define, describe and demonstrate composite materials processing and use in airframe fabrication.

12. Define and describe the stages and forms of interference in a basic or satellite communication systems.

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STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education SECONDARY NUMBER: 8600280

COURSE TITLE: Exploration of Aerospace Technology

01.0 DEMONSTRATE PROPER AND SAFE PROCEDURES WHILE WORKING WITH TECHNOLOGICAL TOOLS, APPARATUS, EQUIPMENT, SYSTEMS, AND MATERIALS--
The student will be able to:

01.01 Follow laboratory safety rules and procedures.
01.02 Demonstrate good housekeeping at work station within total laboratory.
01.03 Conduct laboratory activities and equipment operations in a safe manner.
01.04 Exercise care and respect for all tools, equipment, and materials.
01.05 Identify color-coding safety standards.
01.06 Safely use hand tools and power equipment.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 EXHIBIT POSITIVE HUMAN RELATIONS AND LEADERSHIP SKILLS--
The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Work cooperatively with others.

03.0 DEMONSTRATE COMPUTER APPLICATION AND LITERACY--
The student will be able to:

03.01 Define terms related to computer parts and usage.
03.02 List ways in which computer are used in technology.
03.03 Discuss advantages and disadvantages in the use of computers.
03.04 Demonstrate the application of a computer.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--
The student will be able to:

04.01 Use the features of books and reference materials, such as table of contents, preface, introduction, titles and subtitles, index, glossary, appendix, bibliography.
04.02 Read and follow complex written directions.
04.03 Find, understand, and apply information from a variety of sources (books, manuals, newspapers, periodicals, directories, reference works, computer printouts, and other printed matter or electronic sources such as video display terminals).
04.04 Use and expand general and specialized vocabulary (including abbreviations, acronyms, and concepts) as appropriate to subject areas studied at the grade level.
04.05 Write Standard English sentences with correct:
  -sentence structure;
  -verb forms;
  -punctuation, capitalization, possessives, plural forms, and other matters of mechanics;
  -word choice and spelling.
04.06 Answer and ask questions coherently and concisely, and follow spoken instructions.
04.07 Identify and comprehend the main and subordinate ideas in lectures and discussions, ask questions to clarify information heard, and report accurately what others have said.

04.08 Perform with accuracy the computations of addition, subtraction, multiplication, and division using natural numbers, fractions, decimals and integers.
04.09 Make and use measurements in both traditional and metric units.
04.10 Formulate and solve problems in mathematical terms, selecting appropriate approaches and tools (mental computation, trial and error, paper-and-pencil techniques, calculator, and computer).
04.11 Solve work-related problems involving the basic arithmetic operations using whole numbers, fractions, decimals, and percents.
04.12 Describe the role of observation and experimentation in the development of scientifc theories.
04.13 Gather scientific information through skills in laboratory, field and library work.
04.14 Draw conclusions or make inferences from data.
04.15 Apply basic scientific/technical solutions to the appropriate problems.

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.

06.0 DEMONSTRATE TECHNOLOGICAL LITERACY--
The student will be able to:

06.01 Outline major historical technological developments or events.
06.02 Identify recent advances in technology.
06.03 Explain problem-solving roles of technology.
06.04 Forecast a technological decision.
06.05 Make a technological decision.
06.06 Define technology.

07.0 DISPLAY AN UNDERSTANDING AND APPRECIATION FOR THE DIGNITY AND WORTH OF HONEST LABOR--
The student will be able to:

07.01 Form an understanding and appreciation for work after listening to or observing technology workers.
07.02 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
07.03 Form an understanding and appreciation for the roles and work of co-workers.

08.0 IDENTIFY AND DISCUSS OCCUPATIONAL AND CAREER INTEREST AREAS IN AVIATION AND SPACE TECHNOLOGY--
The student will be able to:

08.01 Match terms associated with careers in the aviation and space industry to their correct definitions.
08.02 Match occupational areas in the aviation and space industry to their correct definitions.
08.03 Match career-interest areas in the aviation and space industry to their correct definitions.
08.04 List steps in career decision making.
08.05 Describe the interrelationship of the occupational areas in the aviation and space industry.
08.06 Gather personal information.
08.07 Gather general job information and identify occupational and career-interest areas of the occupations in the aviation and space industry.

09.0 DEMONSTRATE KNOWLEDGE OF THE BASIC PRINCIPLES OF AEROSTATICS AND AERODYNAMICS--

The student will be able to:

09.01 State definitions of terms associated with aerostatics and aerodynamics.
09.02 State the Buoyancy Principle.
09.03 State Bernoulli's Principle.
09.04 Match basic forces acting on an aerodyne in flight to their correct definition.
09.05 State descriptions of the basic parts of a glider.
09.06 State definitions of the components of the cross-sectional shape of an aircraft's wing.
09.07 Build an aerostatic vehicle.
09.08 Build an aerodynamic vehicle.

10.0 IDENTIFY AND DEMONSTRATE KNOWLEDGE OF BOTH LIQUID AND SOLID PROPELLENT ROCKET PROPULSION SYSTEMS--

The student will be able to:

10.01 Match terms associated with propulsion systems to their correct definitions.
10.02 State definitions of types of rocket propulsion systems.
10.03 Match parts of a solid-propellant rocket engine to their correct definitions.
10.04 Match parts of a liquid-propellant rocket engine to their correct definitions.
10.05 Discuss the principle of rocket propulsion.
10.06 Label the major units of the Space Shuttle's propulsion systems.
10.07 Identify the major components of the Space Shuttle's main engines.
10.08 Label the major components of the Space Shuttle's external tank.
10.09 Identify the major components of the Space Shuttle's solid-rocket boosters.
10.10 Compare the propulsion systems of solid and liquid-propellant rockets.
10.11 Simulate a multi-stage rocket launch.
10.12 Construct a solid-propellant model rocket.

11.0 DEFINE, DESCRIBE AND DEMONSTRATE COMPOSITE MATERIALS PROCESSING AND USE IN AIRFRAME FABRICATION--

The student will be able to:

11.01 Match terms associated with airframe manufacturing to their correct definitions.
11.02 Match components of the manufacturing system model to their correct definitions.

12.0 DEFINE AND DESCRIBE THE STAGES AND FORMS OF INTERFERENCE IN A BASIC OR SATELLITE COMMUNICATION SYSTEMS--

The student will be able to:

12.01 State definitions of the terms communication and interference.
12.02 List and define the stages of a basic communication system.
12.03 Describe forms of interference that can occur at various stages in a basic communication system.
12.04 Discuss the importance of feed back in a basic communication system.
12.05 Define parts of the process in a basic communication system.
12.06 Describe the parts of the process in a satellite communication system.
12.07 Describe the parts of the process in a helium-neon laser communication system.
12.08 Use a laser to simulate satellite communications.

CURRICULUM FRAMEWORK PROGRAM AREA: Technology Education

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

COURSE TITLE: Exploration of Construction Technology

CODE NUMBER: Secondary 8600210 Postsecondary ______

Florida CIP 0821.0112EX

SECONDARY SCHOOL CREDITS 0.5 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): X 6-9 ____ 9-12 ____ Postsecondary Adult Vocational

______ Postsecondary Vocational X Other 30, 31

CERTIFICATION COVERAGE: INDUS ARTS @ 4 @ 6 WOODWORK @ 4 BLDG CONST @ 7 G
GEN SHOP @ 4 TEC CONSTR @ 7 G CARPENTRY @ 7 G
I ART-TEC 1 @2

I. MAJOR CONCEPTS/CONTENT: The purpose of this course is for students to explore the kinds and levels of work performed in construction technology. Laboratory experiences will allow students to explore the occupations, skills, and technologies of construction technology.

The content includes, but is not limited to, the exploratory study of construction technology, occupations, skills, safety, human relations, and leadership.

II. LABORATORY ACTIVITIES: Instruction and learning activities are provided in a laboratory setting using hands-on exploratory experiences with the tools and materials appropriate to the course content.

III. SPECIAL NOTE: The Florida Technology Student Association (FL-TSA) is the appropriate student organization for providing leadership training experiences and for reinforcing specific technology skills. When provided, these activities are considered an integral part of this instructional course.

Proposed design code 240 as shown in DVACE joint Memorandum 92-37 of May 27, 1992, is appropriate for this course.

IV. INTENDED OUTCOMES: After successfully completing this course, the student will be able to:

01. Demonstrate proper and safe procedures while working with technological tools, apparatus, equipment, systems, and materials.
02. Exhibit positive human relations and leadership skills.
03. Demonstrate computer application and literacy.
04. Apply basic skills in communication, mathematics, and science appropriate to technological content and learning activities.
05. Demonstrate and apply design/problem-solving processes.
06. Demonstrate technological literacy.
07. Display an understanding and appreciation for the dignity and worth of honest labor.
08. Discuss individual interests and aptitudes as they relate to a career.
09. Identify evolving construction technologies.
10. Perform special skills unique to construction technology.
11. Express a knowledge of factors that impact on construction technology and practices.
12. List requisites and career opportunities for employment in construction technology.

13. Identify kinds and levels of work common to construction technology.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993
PROGRAM AREA: Technology Education SECONDARY NUMBER: 8600210
COURSE TITLE: Exploration of Construction Technology

01.0 DEMONSTRATE PROPER AND SAFE PROCEDURES WHILE WORKING WITH TECHNOLOGICAL TOOLS, APPARATUS, EQUIPMENT, SYSTEMS, AND MATERIALS--

The student will be able to:

01.01 Follow laboratory safety rules and procedures.
01.02 Demonstrate good housekeeping at work station within total laboratory.
01.03 Conduct laboratory activities and equipment operations in a safe manner.
01.04 Exercise care and respect for all tools, equipment, and materials.
01.05 Identify color-coding safety standards.
01.06 Safely use hand tools and power equipment.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 EXHIBIT POSITIVE HUMAN RELATIONS AND LEADERSHIP SKILLS--

The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Work cooperatively with others.

03.0 DEMONSTRATE COMPUTER APPLICATION AND LITERACY--

The student will be able to:

03.01 Define terms related to computer parts and usage.
03.02 List ways in which computer are used in technology.
03.03 Discuss advantages and disadvantages in the use of computers.
03.04 Demonstrate the application of a computer.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--

The student will be able to:

04.01 Use the features of books and reference materials, such as table of contents, preface, introduction, titles and subtitles, index, glossary, appendix, bibliography.
04.02 Read and follow complex written directions.
04.03 Find, understand, and apply information from a variety of sources (books, manuals, newspapers, periodicals, directories, reference works, computer printouts, and other printed matter or electronic sources such as video display terminals).
04.04 Use and expand general and specialized vocabulary (including abbreviations, acronyms, and concepts) as appropriate to subject areas studied at the grade level.
04.05 Write Standard English sentences with correct:
  -sentence structure;
  -verb forms;
  -punctuation, capitalization, possessives, plural forms, and other matters of mechanics;
  -word choice and spelling.
04.06 Answer and ask questions coherently and concisely, and follow spoken instructions.
04.07 Identify and comprehend the main and subordinate ideas in lectures and discussions, ask questions to clarify information heard, and report accurately what others have said.

04.08 Perform with accuracy the computations of addition, subtraction, multiplication, and division using natural numbers, fractions, decimals and integers.
04.09 Make and use measurements in both traditional and metric units.
04.10 Formulate and solve problems in mathematical terms, selecting appropriate approaches and tools (mental computation, trial and error, paper-and-pencil techniques, calculator, and computer).
04.11 Solve work-related problems involving the basic arithmetic operations using whole numbers, fractions, decimals, and percents.
04.12 Describe the role of observation and experimentation in the development of scientifc theories.
04.13 Gather scientific information through skills in laboratory, field and library work.
04.14 Draw conclusions or make inferences from data.
04.15 Apply basic scientific/technical solutions to the appropriate problems.

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.

06.0 DEMONSTRATE TECHNOLOGICAL LITERACY--
The student will be able to:

06.01 Outline major historical technological developments or events.
06.02 Identify recent advances in technology.
06.03 Explain problem-solving roles of technology.
06.04 Forecast a technological decision.
06.05 Make a technological decision.
06.06 Define technology.

07.0 DISPLAY AN UNDERSTANDING AND APPRECIATION FOR THE DIGNITY AND WORTH OF HONEST LABOR--
The student will be able to:

07.01 Form an understanding and appreciation for work after listening to or observing technology workers.
07.02 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
07.03 Form an understanding and appreciation for the roles and work of co-workers.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 IDENTIFY EVOLVING CONSTRUCTION TECHNOLOGIES--
The student will be able to:

09.01 List evolving technologies in construction.
09.02 Report on a recent evolving technology in construction.

10.0 PERFORM SPECIAL SKILLS UNIQUE TO CONSTRUCTION TECHNOLOGY--
The student will be able to:

10.01 Interpret construction plans and blueprints.

10.02 Identify construction materials.
10.03 Apply carpentry skills.
10.04 Apply plumbing skills.
10.05 Apply electrical wiring skills.
10.06 Apply masonry skills.
10.07 Describe or demonstrate the construction skills of plastering, roofing and finishing.

11.0 EXPRESS A KNOWLEDGE OF FACTORS THAT IMPACT ON CONSTRUCTION TECHNOLOGY AND PRACTICES--
The student will be able to:

11.01 Explain economic factors that impact on construction technology.
11.02 Research and identify types and styles of construction desired by consumers.
11.03 List sources of raw materials and standard stock materials available to construction technology.
11.04 Express a knowledge of construction technology labor organizations and hiring practices.

12.0 LIST REQUISITES AND CAREER OPPORTUNITIES FOR EMPLOYMENT IN CONSTRUCTION TECHNOLOGY--
The student will be able to:

12.01 List occupations, job requirements, and employment opportunities in construction technology.
12.02 List occupational training programs and academic programs at the postsecondary levels in construction technologies.

13.0 IDENTIFY KINDS AND LEVELS OF WORK COMMON TO CONSTRUCTION TECHNOLOGY--
The student will be able to:

13.01 Identify kinds of work related to construction technologies.
13.02 Identify semiskilled, skilled, and professional levels of work in construction technology.

CURRICULUM FRAMEWORK PROGRAM AREA: Technology Education

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

COURSE TITLE: Exploration of Graphic Communications Technology

CODE NUMBER: Secondary 8600220 Postsecondary ______

Florida CIP 0821.0116EX

SECONDARY SCHOOL CREDITS 0.5 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): X 6-9 ______ 9-12 ______ Postsecondary Adult Vocational

______ Postsecondary Vocational X Other 30, 31

CERTIFICATION COVERAGE: INDUS ARTS @ 4 @ 6 GRAPHIC ARTS @ 4
GEN SHOP @ 4 PRINTING @ 4 @ 7 G
I ART-TEC 1 @2

I. MAJOR CONCEPTS/CONTENT: The purpose of this course is for students to explore the kinds and levels of work performed in graphic communications technology. Laboratory experiences will allow students to explore the occupations, skills, and technologies of graphic communications.

The content includes, but is not limited to, the exploratory study of graphic communications technology, occupations, skills, safety, human relations, and leadership.

II. LABORATORY ACTIVITIES: Instruction and learning activities provided in a laboratory setting using hands-on exploratory experiences with the tools and materials appropriate to the course content.

III. SPECIAL NOTE: The Florida Technology Student Association (FL-TSA) is the appropriate student organization for providing leadership training experiences and for reinforcing specific technology skills. When provided, these activities are considered an integral part of this instructional course.

Proposed design code 240 as shown in DVACE joint Memorandum 92-37 of May 27, 1992, is appropriate for this course.

IV. INTENDED OUTCOMES: After successfully completing this course, the student will be able to:

01. Demonstrate proper and safe procedures while working with technological tools, apparatus, equipment, systems, and materials.
02. Exhibit positive human relations and leadership skills.
03. Demonstrate computer application and literacy.
04. Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.
05. Demonstrate and apply design/problem-solving processes.
06. Demonstrate technological literacy.
07. Display an understanding and appreciation for the dignity and worth of honest labor.
08. Discuss individual interests and aptitudes as they relate to a career.
09. Identify evolving technologies in graphic communications.
10. Perform special skills unique to graphic communications technology.
11. Express a knowledge of factors that impact on graphic communications technology and practices.

12. List requisites and career opportunities for employment in graphic communications technology.
13. Identify kinds and levels of work common to graphic communications technology.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education SECONDARY NUMBER: 8600220

COURSE TITLE: Exploration of Graphic
Communications Technology

01.0 DEMONSTRATE PROPER AND SAFE PROCEDURES WHILE WORKING WITH TECHNOLOGICAL TOOLS, APPARATUS, EQUIPMENT, SYSTEMS, AND MATERIALS--The student will be able to:

01.01 Follow laboratory safety rules and procedures.
01.02 Demonstrate good housekeeping at work station within total laboratory.
01.03 Conduct laboratory activities and equipment operations in a safe manner.
01.04 Exercise care and respect for all tools, equipment, and materials.
01.05 Identify color-coding safety standards.
01.06 Safely use hand tools and power equipment.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 EXHIBIT POSITIVE HUMAN RELATIONS AND LEADERSHIP SKILLS--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Work cooperatively with others.

03.0 DEMONSTRATE COMPUTER APPLICATION AND LITERACY--The student will be able to:

03.01 Define terms related to computer parts and usage.
03.02 List ways in which computer are used in technology.
03.03 Discuss advantages and disadvantages in the use of computers.
03.04 Demonstrate the application of a computer.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Use the features of books and reference materials, such as table of contents, preface, introduction, titles and subtitles, index, glossary, appendix, bibliography.
04.02 Read and follow complex written directions.
04.03 Find, understand, and apply information from a variety of sources (books, manuals, newspapers, periodicals, directories, reference works, computer printouts, and other printed matter or electronic sources such as video display terminals).
04.04 Use and expand general and specialized vocabulary (including abbreviations, acronyms, and concepts) as appropriate to subject areas studied at the grade level.
04.05 Write Standard English sentences with correct:
  -sentence structure;
  -verb forms;
  -punctuation, capitalization, possessives, plural forms, and other matters of mechanics;
  -word choice and spelling.
04.06 Answer and ask questions coherently and concisely, and follow spoken instructions.

04.07 Identify and comprehend the main and subordinate ideas in lectures and discussions, ask questions to clarify information heard, and report accurately what others have said.
04.08 Perform with accuracy the computations of addition, subtraction, multiplication, and division using natural numbers, fractions, decimals and integers.
04.09 Make and use measurements in both traditional and metric units.
04.10 Formulate and solve problems in mathematical terms, selecting appropriate approaches and tools (mental computation, trial and error, paper-and-pencil techniques, calculator, and computer).
04.11 Solve work-related problems involving the basic arithmetic operations using whole numbers, fractions, decimals, and percents.
04.12 Describe the role of observation and experimentation in the development of scientifc theories.
04.13 Gather scientific information through skills in laboratory, field and library work.
04.14 Draw conclusions or make inferences from data.
04.15 Apply basic scientific/technical solutions to the appropriate problems.

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.

06.0 DEMONSTRATE TECHNOLOGICAL LITERACY--
The student will be able to:

06.01 Outline major historical technological developments or events.
06.02 Identify recent advances in technology.
06.03 Explain problem-solving roles of technology.
06.04 Forecast a technological decision.
06.05 Make a technological decision.
06.06 Define technology.

07.0 DISPLAY AN UNDERSTANDING AND APPRECIATION FOR THE DIGNITY AND WORTH OF HONEST LABOR--
The student will be able to:

07.01 Form an understanding and appreciation for work after listening to or observing technology workers.
07.02 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
07.03 Form an understanding and appreciation for the roles and work of co-workers.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 IDENTIFY EVOLVING TECHNOLOGIES IN GRAPHIC COMMUNICATIONS--
The student will be able to:

09.01 List evolving technologies in graphic communications technology.
09.02 Report on a recent evolving technology in graphic communications.

10.0 PERFORM SPECIAL SKILLS UNIQUE TO GRAPHIC COMMUNICATIONS TECHNOLOGY--
The student will be able to:

10.01 Identify and use basic drafting tools and instruments for making drawings.
10.02 Use proper layout and design skills for producing a printed product.
10.03 Produce a product utilizing relief printing technology and skills.
10.04 Produce a product utilizing screen process printing technology and skills.
10.05 Produce a product utilizing lithographic printing technology and skills.
10.06 Produce a product utilizing gravure printing technology and skills.
10.07 Produce a print utilizing photographic technology and skills.
10.08 Use bindery skills to produce a book or booklet.

11.0 EXPRESS A KNOWLEDGE OF FACTORS THAT IMPACT ON GRAPHIC COMMUNICATIONS TECHNOLOGY AND PRACTICES--
The student will be able to:

11.01 Explain economic factors that impact on graphic communications technology.
11.02 Research and identify styles and types of printed products desired by customers or consumers.
11.03 Identify the natural and synthetic resources required for papers, inks, rollers, and solutions used in graphic communications technology.
11.04 Express a knowledge of graphic communications technology labor organizations and hiring practices.

12.0 LIST REQUISITES AND CAREER OPPORTUNITIES FOR EMPLOYMENT IN GRAPHIC COMMUNICATIONS TECHNOLOGY--
The student will be able to:

12.01 List occupations, job requirements, and employment opportunities in graphic communication technology.
12.02 List occupational training programs and academic programs at the postsecondary levels in graphic communications technologies.

13.0 IDENTIFY KINDS AND LEVELS OF WORK COMMON TO GRAPHIC COMMUNICATIONS TECHNOLOGY--
The student will be able to:

13.01 Identify kinds of work related to graphic communications technologies.
13.02 Identify semiskilled, skilled, and professional levels of work in graphic communications technology.

CURRICULUM FRAMEWORK PROGRAM AREA: Technology Education

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

COURSE TITLE: Exploration of Manufacturing Technology

CODE NUMBER: Secondary 8600230 Postsecondary ______

Florida CIP 0821.0117EX

SECONDARY SCHOOL CREDITS .5 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS

APPLICABLE LEVEL(S): X 6-9 ____ 9-12 ____ Postsecondary Adult Vocational

____ Postsecondary Vocational X Other 30, 31

CERTIFICATION COVERAGE: INDUS ARTS @ 4 @ 6 METALS @ 4
GEN SHOP @ 4 WOODWORK @ 4
I ART-TEC 1 @2

I. **MAJOR CONCEPTS/CONTENT**: The purpose of this course is for students to explore the kinds and levels of work performed in manufacturing technology. Laboratory experiences will allow students to explore the occupations, skills, and technologies of manufacturing.

The content includes, but is not limited to, the exploratory study of manufacturing technology, occupations, skills, safety, human relations, and leadership.

II. **LABORATORY ACTIVITIES**: Instruction and learning activities are provided in a laboratory setting using hands-on exploratory experiences with the tools and materials appropriate to the course content.

III. **SPECIAL NOTE**: The Florida Technology Student Association (FL-TSA) is the appropriate student organization for providing leadership training experiences and for reinforcing specific technology skills. When provided, these activities are considered an integral part of this instructional course.

Proposed design code 240 as shown in DVACE joint Memorandum 92-37 of May 27, 1992, is appropriate for this course.

IV. **INTENDED OUTCOMES**: After successfully completing this course, the student will be able to:

01. Demonstrate proper and safe procedures while working with technological tools, apparatus, equipment, systems, and materials.
02. Exhibit positive human relations and leadership skills.
03. Demonstrate computer application and literacy.
04. Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.
05. Demonstrate and apply design/problem-solving processes.
06. Demonstrate technological literacy.
07. Display an understanding and appreciation for the dignity and worth of honest labor.
08. Discuss individual interests and aptitudes as they relate to a career.
09. Identify evolving manufacturing technologies.
10. Perform special skills unique to manufacturing technology.
11. Express a knowledge of factors that impact on manufacturing technology and practices.
12. List requisites and career opportunities for employment in manufacturing technology.

STUDENT PERFORMANCE STANDARDS　　EFFECTIVE DATE: July 1993

PROGRAM AREA: Technology Education　　SECONDARY NUMBER: 8600230

COURSE TITLE: Exploration of Manufacturing Technology

01.0 DEMONSTRATE PROPER AND SAFE PROCEDURES WHILE WORKING WITH TECHNOLOGICAL TOOLS, APPARATUS, EQUIPMENT, SYSTEMS, AND MATERIALS--The student will be able to:

01.01 Follow laboratory safety rules and procedures.
01.02 Demonstrate good housekeeping at work station within total laboratory.
01.03 Conduct laboratory activities and equipment operations in a safe manner.
01.04 Exercise care and respect for all tools, equipment, and materials.
01.05 Identify color-coding safety standards.
01.06 Safely use hand tools and power equipment.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 EXHIBIT POSITIVE HUMAN RELATIONS AND LEADERSHIP SKILLS--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Work cooperatively with others.

03.0 DEMONSTRATE COMPUTER APPLICATION AND LITERACY--The student will be able to:

03.01 Define terms related to computer parts and usage.
03.02 List ways in which computer are used in technology.
03.03 Discuss advantages and disadvantages in the use of computers.
03.04 Demonstrate the application of a computer.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Use the features of books and reference materials, such as table of contents, preface, introduction, titles and subtitles, index, glossary, appendix, bibliography.
04.02 Read and follow complex written directions.
04.03 Find, understand, and apply information from a variety of sources (books, manuals, newspapers, periodicals, directories, reference works, computer printouts, and other printed matter or electronic sources such as video display terminals).
04.04 Use and expand general and specialized vocabulary (including abbreviations, acronyms, and concepts) as appropriate to subject areas studied at the grade level.
04.05 Write Standard English sentences with correct:
  -sentence structure;
  -verb forms;
  -punctuation, capitalization, possessives, plural forms, and other matters of mechanics;
  -word choice and spelling.
04.06 Answer and ask questions coherently and concisely, and follow spoken instructions.

04.07 Identify and comprehend the main and subordinate ideas in lectures and discussions, ask questions to clarify information heard, and report accurately what others have said.
04.08 Perform with accuracy the computations of addition, subtraction, multiplication, and division using natural numbers, fractions, decimals and integers.
04.09 Make and use measurements in both traditional and metric units.
04.10 Formulate and solve problems in mathematical terms, selecting appropriate approaches and tools (mental computation, trial and error, paper-and-pencil techniques, calculator, and computer).
04.11 Solve work-related problems involving the basic arithmetic operations using whole numbers, fractions, decimals, and percents.
04.12 Describe the role of observation and experimentation in the development of scientifc theories.
04.13 Gather scientific information through skills in laboratory, field and library work.
04.14 Draw conclusions or make inferences from data.
04.15 Apply basic scientific/technical solutions to the appropriate problems.

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.

06.0 DEMONSTRATE TECHNOLOGICAL LITERACY--
The student will be able to:

06.01 Outline major historical technological developments or events.
06.02 Identify recent advances in technology.
06.03 Explain problem-solving roles of technology.
06.04 Forecast a technological decision.
06.05 Make a technological decision.
06.06 Define technology.

07.0 DISPLAY AN UNDERSTANDING AND APPRECIATION FOR THE DIGNITY AND WORTH OF HONEST LABOR--
The student will be able to:

07.01 Form an understanding and appreciation for work after listening to or observing technology workers.
07.02 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
07.03 Form an understanding and appreciation for the roles and work of co-workers.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 IDENTIFY EVOLVING MANUFACTURING TECHNOLOGIES--
The student will be able to:

09.01 List evolving technologies in manufacturing.
09.02 Report on a recent evolving technology in manufacturing.

10.0 PERFORM SPECIAL SKILLS UNIQUE TO MANUFACTURING TECHNOLOGY--
The student will be able to:

10.01 Design a product for custom or mass production manufacturing.
10.02 Plan a mass production system for manufacturing a product.
10.03 Perform materials forming practices such as casting or molding, and compressing or stretching.
10.04 Perform materials separating practices such as shearing, chip removing, and other separating processes.
10.05 Perform materials conditioning practices such as heat treating, physical conditioning, or through chemical reactions.
10.06 Combine components through mixing, coating, bonding, and mechanical fastening.
10.07 Assemble a product or a subassembly of a product.

11.0 EXPRESS A KNOWLEDGE OF FACTORS THAT IMPACT ON MANUFACTURING TECHNOLOGY AND PRACTICES--
The student will be able to:

11.01 Explain economic factors that impact on manufacturing technology.
11.02 Research and identify consumer demands for a manufactured product.
11.03 Identify sources of raw materials and/or standard stock materials needed for a manufactured product.
11.04 Interview, hire, train, or promote an applicant or employee for a simulated mass production manufacturing activity.
11.05 Define the terms "organized labor" and "collective bargaining."
11.06 Prepare a plan for marketing and distributing a manufactured product.

12.0 LIST REQUISITES AND CAREER OPPORTUNITIES FOR EMPLOYMENT IN MANUFACTURING TECHNOLOGY--
The student will be able to:

12.01 List occupations, job requirements, and employment opportunities in manufacturing technology.
12.02 List occupational training programs and academic programs at the postsecondary levels in manufacturing technologies.

13.0 IDENTIFY KINDS AND LEVELS OF WORK COMMON TO MANUFACTURING TECHNOLOGY-
The student will be able to:

13.01 Identify kinds of work related to manufacturing technologies.
13.02 Identify semiskilled, skilled, and professional levels of work in manufacturing technology.

CURRICULUM FRAMEWORK PROGRAM AREA: Technology Education

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

COURSE TITLE: Exploration of Power and Transportation Technology

CODE NUMBER: Secondary 8600240 Postsecondary ______

Florida CIP 0821.0115EX

SECONDARY SCHOOL CREDITS 0.5 COLLEGE CREDITS _____ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _X_ 6-9 ___ 9-12 ___ Postsecondary Adult Vocational

_____ Postsecondary Vocational _X_ Other 30, 31

CERTIFICATION COVERAGE: INDUS ARTS @ 4 @ 6 TRANSPORT @ 4 AUTO MECH @ 7 G
GEN SHOP @ 4 GAS ENG RPR @ 7 G
I ART-TEC 1 @2

I. MAJOR CONCEPTS/CONTENT: The purpose of this course is for students to explore the kinds and levels of work performed in power and transportation technology. Laboratory experiences will allow student to explore the occupations, skills, and technologies of power and transportation technology.

The content includes, but is not limited to, the exploratory study of power and transportation technology, occupations, skills, safety, human relations, and leadership.

II. LABORATORY ACTIVITIES: Instruction and learning activities are provided in a laboratory setting using hands-on exploratory experiences with the tools and materials appropriate to the course content.

III. SPECIAL NOTE: The Florida Technology Student Association (FL-TSA) is the appropriate student organization for providing leadership training experiences and for reinforcing specific technology skills. When provided, these activities are considered an integral part of this instructional course.

Proposed design code 240 as shown in DVACE joint Memorandum 92-37 of May 27, 1992, is appropriate for this course.

IV. INTENDED OUTCOMES: After successfully completing this course, the student will be able to:

01. Demonstrate proper and safe procedures while working with technological tools, apparatus, equipment, systems, and materials.
02. Exhibit positive human relations and leadership skills.
03. Demonstrate computer application literacy.
04. Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.
05. Demonstrate and apply design/problem-solving processes.
06. Demonstrate technological literacy.
07. Display an understanding and appreciation for the dignity and worth of honest labor.
08. Discuss individual interests and aptitudes as they relate to a career.
09. Identify evolving technologies in power and transportation industries.
10. Perform special skills unique to power and transportation technologies.

11. Express a knowledge of the industries that deal with power and transportation technology.
12. List requisites and career opportunities for employment in power and transportation technology.
13. Identify kinds and levels of work common to the power and transportation technology.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education SECONDARY NUMBER: 8600240

COURSE TITLE: Exploration of Power and Transportation Technology

01.0 DEMONSTRATE PROPER AND SAFE PROCEDURES WHILE WORKING WITH TECHNOLOGICAL TOOLS, APPARATUS, EQUIPMENT, SYSTEMS, AND MATERIALS--The student will be able to:

01.01 Follow laboratory safety rules and procedures.
01.02 Demonstrate good housekeeping at work station within total laboratory.
01.03 Conduct laboratory activities and equipment operations in a safe manner.
01.04 Exercise care and respect for all tools, equipment, and materials.
01.05 Identify color-coding safety standards.
01.06 Safely use hand tools and power equipment.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 EXHIBIT POSITIVE HUMAN RELATIONS AND LEADERSHIP SKILLS--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Work cooperatively with others.

03.0 DEMONSTRATE COMPUTER APPLICATION AND LITERACY--The student will be able to:

03.01 Define terms related to computer parts and usage.
03.02 List ways in which computer are used in technology.
03.03 Discuss advantages and disadvantages in the use of computers.
03.04 Demonstrate the application of a computer.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Use the features of books and reference materials, such as table of contents, preface, introduction, titles and subtitles, index, glossary, appendix, bibliography.
04.02 Read and follow complex written directions.
04.03 Find, understand, and apply information from a variety of sources (books, manuals, newspapers, periodicals, directories, reference works, computer printouts, and other printed matter or electronic sources such as video display terminals).
04.04 Use and expand general and specialized vocabulary (including abbreviations, acronyms, and concepts) as appropriate to subject areas studied at the grade level.
04.05 Write Standard English sentences with correct:
  -sentence structure;
  -verb forms;
  -punctuation, capitalization, possessives, plural forms, and other matters of mechanics;
  -word choice and spelling.
04.06 Answer and ask questions coherently and concisely, and follow spoken instructions.

04.07 Identify and comprehend the main and subordinate ideas in lectures and discussions, ask questions to clarify information heard, and report accurately what others have said.
04.08 Perform with accuracy the computations of addition, subtraction, multiplication, and division using natural numbers, fractions, decimals and integers.
04.09 Make and use measurements in both traditional and metric units.
04.10 Formulate and solve problems in mathematical terms, selecting appropriate approaches and tools (mental computation, trial and error, paper-and-pencil techniques, calculator, and computer).
04.11 Solve work-related problems involving the basic arithmetic operations using whole numbers, fractions, decimals, and percents.
04.12 Describe the role of observation and experimentation in the development of scientifc theories.
04.13 Gather scientific information through skills in laboratory, field and library work.
04.14 Draw conclusions or make inferences from data.
04.15 Apply basic scientific/technical solutions to the appropriate problems.

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.

06.0 DEMONSTRATE TECHNOLOGICAL LITERACY--
The student will be able to:

06.01 Outline major historical technological developments or events.
06.02 Identify recent advances in technology.
06.03 Explain problem-solving roles of technology.
06.04 Forecast a technological decision.
06.05 Make a technological decision.
06.06 Define technology.

07.0 DISPLAY AN UNDERSTANDING AND APPRECIATION FOR THE DIGNITY AND WORTH OF HONEST LABOR--
The student will be able to:

07.01 Form an understanding and appreciation for work after listening to or observing technology workers.
07.02 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
07.03 Form an understanding and appreciation for the roles and work of co-workers.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 IDENTIFY EVOLVING TECHNOLOGIES IN POWER AND TRANSPORTATION INDUSTRIES--
The student will be able to:

09.01 List evolving technologies in power technology.
09.02 List evolving technologies in transportation technology.
09.03 Report on a recent evolving technology in power and transportation.

10.0 PERFORM SPECIAL SKILLS UNIQUE TO POWER AND TRANSPORTATION TECHNOLOGIES--
The student will be able to:

10.01 Disassemble and reassemble or perform maintenance on a muscle powered bicycle.
10.02 Disassemble and reassemble or perform maintenance on a pneumatic or hydraulic device.
10.03 Disassemble and reassemble or perform maintenance on an internal combustion engine.
10.04 Disassemble and reassemble or perform maintenance on an electrical motor, generator, or alternator.
10.05 Construct, maintain, or repair a land, water, or air/space vehicle.
10.06 Construct a water-powered, wind-powered, steam-powered, thermal-powered, or solar-powered device.

11.0 EXPRESS A KNOWLEDGE OF THE INDUSTRIES THAT DEAL WITH POWER AND TRANSPORTATION TECHNOLOGY--
The student will be able to:

11.01 Identify the technologies that supply or control energy sources.
11.02 Identify technologies that produce power systems.
11.03 Describe power and energy applications in transportation technology.
11.04 List transportation systems produced or used by industries.

12.0 LIST REQUISITES AND CAREER OPPORTUNITIES FOR EMPLOYMENT IN POWER AND TRANSPORTATION TECHNOLOGY--
The student will be able to:

12.01 List occupations, job requirements, and employment opportunities in power technology.
12.02 List occupations and employment opportunities in transportation technology.
12.03 List occupational training programs and academic programs available at the postsecondary levels in power and in transportation technologies.

13.0 IDENTIFY KINDS AND LEVELS OF WORK COMMON TO POWER AND TRANSPORTATION TECHNOLOGY--
The student will be able to:

13.01 Identify kinds of work related to power technologies.
13.02 Identify kinds of work related to transportation technologies.
13.03 Identify semiskilled, skilled, and professional levels of work in power and transportation technology.

CURRICULUM FRAMEWORK PROGRAM AREA: Technology Education

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Exploration of Electricity/Electronics Technology

CODE NUMBER: Secondary 8600250 Postsecondary ____

Florida CIP 0821.0118EX

SECONDARY SCHOOL CREDITS 0.5 COLLEGE CREDITS __ POSTSECONDARY ADULT VOCATIONAL CREDITS ___

APPLICABLE LEVEL(S): X 6-9 ___ 9-12 ____ Postsecondary Adult Vocational

___ Postsecondary Vocational X Other 30,31

CERTIFICATION COVERAGE: I ART - TEC 1 @ 2 INDUS ARTS @ 4 @ 6

I. MAJOR CONCEPTS/CONTENT: The purpose of this course is for students to explore the kinds and levels of work performed in electricity/electronics technology. Laboratory experiences will allow students to explore the occupations and skills of electricity/electronics technology.

The content includes, but is not limited to, the exploratory study of electricity/electronics technology, occupations, skills, safety, human relations, and leadership.

II. LABORATORY ACTIVITIES: Instruction and learning activities are provided in a laboratory setting using hands-on exploratory experiences with the tools and materials appropriate to the course content.

III. SPECIAL NOTE: The Florida Technology Student Association (FL-TSA) is the appropriate student organization for providing leadership training experiences and for reinforcing specific technology skills. When provided, these activities are considered an integral part of this instructional course.

Proposed design code 240 as shown in DVACE joint Memorandum 92-37 of May 27, 1992, is appropriate for this course.

IV. INTENDED OUTCOMES: After successfully completing this course, the student will be able to:

01. Demonstrate proper and safe procedures while working with technological tools, apparatus, equipment, systems, and materials.
02. Exhibit positive human relations and leadership skills.
03. Demonstrate computer application and literacy.
04. Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.
05. Demonstrate and apply design/problem-solving processes.
06. Demonstrate technological literacy.
07. Display an understanding and appreciation for the dignity and worth of honest labor.
08. Discuss individual interests and aptitudes as they relate to a career.
09. Identify evolving technologies in electricity/electronics.
10. Perform special skills unique to electricity/electronics technology.
11. Express a knowledge of factors that impact on electricity/electronics technology and practices.

12. List requisites and career opportunities for employment in electricity/electronics technology.
13. Identify kinds and levels of work common to electricity/electronics technology.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education **PROGRAM NUMBER:** 8600250

COURSE TITLE: Exploration of Electricity/Electronics Technology

01.0 DEMONSTRATE PROPER AND SAFE PROCEDURES WHILE WORKING WITH TECHNOLOGICAL TOOLS, APPARATUS, EQUIPMENT, SYSTEMS, AND MATERIALS--The student will be able to:

01.01 Follow laboratory safety rules and procedures.
01.02 Demonstrate good housekeeping at work station within total laboratory.
01.03 Conduct laboratory activities and equipment operations in a safe manner.
01.04 Exercise care and respect for all tools, equipment, and materials.
01.05 Identify color-coding safety standards.
01.06 Safely use hand tools and power equipment.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 EXHIBIT POSITIVE HUMAN RELATIONS AND LEADERSHIP SKILLS--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Work cooperatively with others.

03.0 DEMONSTRATE COMPUTER APPLICATION AND LITERACY--The student will be able to:

03.01 Define terms related to computer parts and usage.
03.02 List ways in which computer are used in technology.
03.03 Discuss advantages and disadvantages in the use of computers.
03.04 Demonstrate the application of a computer.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Use the features of books and reference materials, such as table of contents, preface, introduction, titles and subtitles, index, glossary, appendix, bibliography.
04.02 Read and follow complex written directions.
04.03 Find, understand, and apply information from a variety of sources (books, manuals, newspapers, periodicals, directories, reference works, computer printouts, and other printed matter or electronic sources such as video display terminals).
04.04 Use and expand general and specialized vocabulary (including abbreviations, acronyms, and concepts) as appropriate to subject areas studied at the grade level.
04.05 Write Standard English sentences with correct:
  -sentence structure;
  -verb forms;
  -punctuation, capitalization, possessives, plural forms, and other matters of mechanics;
  -word choice and spelling.
04.06 Answer and ask questions coherently and concisely, and follow spoken instructions.
04.07 Identify and comprehend the main and subordinate ideas in lectures and discussions, ask questions to clarify information heard, and report accurately what others have said.

04.08 Perform with accuracy the computations of addition, subtraction, multiplication, and division using natural numbers, fractions, decimals and integers.
04.09 Make and use measurements in both traditional and metric units.
04.10 Formulate and solve problems in mathematical terms, selecting appropriate approaches and tools (mental computation, trial and error, paper-and-pencil techniques, calculator, and computer).
04.11 Solve work-related problems involving the basic arithmetic operations using whole numbers, fractions, decimals, and percents.
04.12 Describe the role of observation and experimentation in the development of scientifc theories.
04.13 Gather scientific information through skills in laboratory, field and library work.
04.14 Draw conclusions or make inferences from data.
04.15 Apply basic scientific/technical solutions to the appropriate problems.

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.

06.0 DEMONSTRATE TECHNOLOGICAL LITERACY--
The student will be able to:

06.01 Outline major historical technological developments or events.
06.02 Identify recent advances in technology.
06.03 Explain problem-solving roles of technology.
06.04 Forecast a technological decision.
06.05 Make a technological decision.
06.06 Define technology.

07.0 DISPLAY AN UNDERSTANDING AND APPRECIATION FOR THE DIGNITY AND WORTH OF HONEST LABOR--
The student will be able to:

07.01 Form an understanding and appreciation for work after listening to or observing technology workers.
07.02 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
07.03 Form an understanding and appreciation for the roles and work of co-workers.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 IDENTIFY EVOLVING TECHNOLOGIES IN ELECTRICITY/ELECTRONICS--
The student will be able to:

09.01 List evolving technologies in electricity/electronics technology.
09.02 Report on a recent evolving technology in electricity/electronics.

10.0 PERFORM SPECIAL SKILLS UNIQUE TO ELECTRICITY/ELECTRONICS TECHNOLOGY--
The student will be able to:

10.01 Identify, analyze and prepare electricity/electronics diagrams and schematics.
10.02 Identify and use electronic instrumentation equipment. Use a voltage/Ohm meter. Set up and use an oscilloscope.
10.03 Describe and construct control and sensor circuits.
10.04 Describe and construct conversion circuits.
10.05 Describe and construct communications circuits.
10.06 Describe and construct digital circuits.
10.07 Define and describe a robot and robotic workcell.
10.08 Conduct robot and robotic workcell experiments.

11.0 EXPRESS A KNOWLEDGE OF FACTORS THAT IMPACT ON ELECTRICITY/ELECTRONICS TECHNOLOGY AND PRACTICES--
The student will be able to:

11.01 Explain economic factors that impact on electricity/electronics technology products produced for consumers.
11.02 List sources of raw materials and standard stock materials available to electricity/electronics technology.
11.03 Express a knowledge of electricity/electronics technology labor organizations and hiring practices.

12.0 LIST REQUISITES AND CAREER OPPORTUNITIES FOR EMPLOYMENT IN ELECTRICITY/ELECTRONICS TECHNOLOGY--
The student will be able to:

12.01 List occupations, job requirements, and employment opportunities in electricity/electronics technology.
12.02 List occupational training programs and academic programs at the secondary and postsecondary levels in electricity/electronics technologies.

13.0 IDENTIFY KINDS AND LEVELS OF WORK COMMON TO ELECTRICITY/ELECTRONICS TECHNOLOGY--
The student will be able to:

13.01 Identify kinds of work related to electricity/electronics technology.
13.02 Identify semi-skilled, skilled, and professional levels of work in electricity/electronics technology.

CURRICULUM FRAMEWORK PROGRAM AREA: Technology Education

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

COURSE TITLE: Practical Visual Communications

CODE NUMBER: Secondary 8600310 Postsecondary ______

Florida CIP 0821.0124PA

SECONDARY SCHOOL CREDITS .5 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 X 9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational X Other 30, 31

CERTIFICATION COVERAGE: INDUS ARTS @ 4 @ 6 GRAPHIC ARTS @ 4
GEN SHOP @ 4 I ART-TEC 1 @ 2

I. MAJOR CONCEPTS/CONTENT: This course is designed to provide students with a practical foundation of knowledge and skills concerning visual communications technology.

The content includes, but is not limited to, the general study and application of technology related to drafting, layout and design, printing, copying, materials, safety, and leadership.

II. LABORATORY ACTIVITIES: Learning activities are provided in a laboratory setting using hands-on experiences with the tools and materials appropriate to the course content.

III. SPECIAL NOTE: The Florida Technology Student Association (FL-TSA) is the appropriate student organization for providing leadership training experiences and for reinforcing specific technology skills. When provided, the activities are considered an integral part of this instructional course.

Proposed design code 242 as shown in DVACE joint Memorandum 92-37 of May 27, 1992, is appropriate for this course.

IV. INTENDED OUTCOMES: After successfully completing this course the student will be able to:

01. Demonstrate proper and safe procedures while working with technological tools, apparatus, equipment, systems, and materials.
02. Exhibit positive human relations and leadership skills.
03. Demonstrate computer application and literacy.
04. Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.
05. Apply practical visual communications technology skills.
06. Demonstrate a practical technological literacy about visual communications.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993
PROGRAM AREA: Technology Education
SECONDARY NUMBER: 8600310

COURSE TITLE: Practical Visual Communications

01.0 DEMONSTRATE PROPER AND SAFE PROCEDURES WHILE WORKING WITH TECHNOLOGICAL TOOLS, APPARATUS, EQUIPMENT, SYSTEMS, AND MATERIALS--
The student will be able to:

01.01 Follow laboratory safety rules and procedures.
01.02 Demonstrate good housekeeping at work station within total laboratory.
01.03 Conduct laboratory activities and equipment operations in a safe manner.
01.04 Exercise care and respect for all tools, equipment, and materials.
01.05 Identify color-coding safety standards.
01.06 Safely use hand tools and power equipment.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 EXHIBIT POSITIVE HUMAN RELATIONS AND LEADERSHIP SKILLS--
The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Work cooperatively with others.

03.0 DEMONSTRATE COMPUTER APPLICATION AND LITERACY--
The student will be able to:

03.01 Define terms related to computer parts and usage.
03.02 List ways in which computer are used in technology.
03.03 Discuss advantages and disadvantages in the use of computers.
03.04 Demonstrate the application of a computer.

04.0 APPLY BASIC SKILLS IN ENGLISH, MATHEMATICS AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--
The student will be able to:

04.01 Apply basic English skills of correct spelling, grammar, sentence structure and paragraph structure when completing written and verbal assignments.
04.02 Apply applicable basic mathematical skills of addition, subtraction, multiplication, division, fractions, percentages and measurements when completing written, verbal and performance assignments.
04.03 Apply applicable basic science principles and procedures of force, work, momentum, leverage, energy and power when completing written, verbal and performance assignments.

05.0 APPLY PRACTICAL VISUAL COMMUNICATIONS TECHNOLOGY SKILLS--
The student will be able to:

05.01 Identify the basic tools and instruments for drafting.
05.02 Interpret a blueprint, working drawing or other type of dimensioned technical illustration.
05.03 Produce a working drawing or technical illustration using drafting tools, instruments, and skills.
05.04 Sketch, draw, or paste-up a dummy for printing reproduction using the proper principles of graphic arts layout and design.

05.05 Explain the distinguishing features of families and styles of type.
05.06 Identify and perform the processes of relief, gravure, lithographic, and screen printing.
05.07 Design, layout, and produce a printed product utilizing the tools, equipment, materials and processes of one or more of the above printing processes.
05.08 Express a knowledge of the basic theory of photography.
05.09 Produce a photographic negative and print utilizing the tools, equipment, materials and processes of photography.
05.10 Produce printed material through word processing and electrostatic copying.
05.11 Describe the basic characteristics and specifications of paper, ink, and chemicals used in visual communications technology.
05.12 List ways in which computers are used in visual communications technology.
05.13 Operate a computer utilizing a program related to visual communications technology.
05.14 Use a camcorder in producing a video tape production.

06.0 DEMONSTRATE A PRACTICAL TECHNOLOGICAL LITERACY ABOUT VISUAL COMMUNICATIONS--
The student will be able to:

06.01 Outline major technological developments and events in the history of visual communications.
06.02 Identify recent advances in visual communications technology.
06.03 Explain the problem-solving roles of visual communications technology in an American and world society.
06.04 Forecast a development or event in visual communications technology.
06.05 Make a technological decision related to visual communications.
06.06 Define visual communications technology.

CURRICULUM FRAMEWORK PROGRAM AREA: Technology Education

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

COURSE TITLE: Practical Home Maintenance

CODE NUMBER: Secondary 8600320 Postsecondary ______

Florida CIP 0821.0122PA

SECONDARY SCHOOL CREDITS 0.5 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 X 9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational X Other 30, 31

CERTIFICATION COVERAGE: INDUS ARTS @ 4 @ 6 I ART-TEC 1 @ 2
GEN SHOP @ 4

I. MAJOR CONCEPTS/CONTENT: This course is designed to provide students with a practical foundation of knowledge and skills concerning home maintenance.

The content includes, but is not limited to, the general study and application of home maintenance related to the electrical, plumbing, and structural systems in a home, finishing methods, sanitation, repairs, safety, and leadership.

II. LABORATORY ACTIVITIES: Learning activities are provided in a laboratory setting using hands-on experiences with the tools and materials appropriate to the course content.

III. SPECIAL NOTE: The Florida Technology Student Association (FL-TSA) is the appropriate student organization for providing leadership training experiences and for reinforcing specific technology skills. When provided, the activities are considered an integral part of this instructional course.

Proposed design code 242 as shown in DVACE joint Memorandum 92-37 of May 27, 1992, is appropriate for this course.

IV. INTENDED OUTCOMES: After successfully completing this course, the student will be able to:

01. Demonstrate proper and safe procedures while working with technological tools, apparatus, equipment, systems, and materials.
02. Exhibit positive human relations and leadership skills.
03. Demonstrate computer application and literacy.
04. Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.
05. Apply practical home maintenance technology skills.
06. Demonstrate a practical technological literacy about home maintenance.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July 1993

PROGRAM AREA: Technology Education SECONDARY NUMBER: 8600320

COURSE TITLE: Practical Home Maintenance

01.0 DEMONSTRATE PROPER AND SAFE PROCEDURES WHILE WORKING WITH TECHNOLOGICAL TOOLS, APPARATUS, EQUIPMENT, SYSTEMS, AND MATERIALS--
The student will be able to:

01.01 Follow laboratory safety rules and procedures.
01.02 Demonstrate good housekeeping at work station within total laboratory.
01.03 Conduct laboratory activities and equipment operations in a safe manner.
01.04 Exercise care and respect for all tools, equipment, and materials.
01.05 Identify color-coding safety standards.
01.06 Safely use hand tools and power equipment.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 EXHIBIT POSITIVE HUMAN RELATIONS AND LEADERSHIP SKILLS--
The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Work cooperatively with others.

03.0 DEMONSTRATE COMPUTER APPLICATION AND LITERACY--
The student will be able to:

03.01 Define terms related to computer parts and usage.
03.02 List ways in which computer are used in technology.
03.03 Discuss advantages and disadvantages in the use of computers.
03.04 Demonstrate the application of a computer.

04.0 APPLY BASIC SKILLS IN ENGLISH, MATHEMATICS AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--
The student will be able to:

04.01 Apply basic English skills of correct spelling, grammar, sentence structure and paragraph structure when completing written and verbal assignments.
04.02 Apply applicable basic mathematical skills of addition, subtraction, multiplication, division, fractions, percentages and measurements when completing written, verbal and performance assignments.
04.03 Apply applicable basic science principles and procedures of force, work, momentum, leverage, energy and power when completing written, verbal and performance assignments.

05.0 APPLY PRACTICAL HOME MAINTENANCE SKILLS--
The student will be able to:

05.01 Identify and use common tools, materials, and equipment for home maintenance and repairs.
05.02 Perform plumbing maintenance on pipes, faucets, flush tanks, drains, traps, and sewer systems.
05.03 Perform wall, floor, and ceiling maintenance.
05.04 Perform roof maintenance and repairs.
05.05 Perform window and door maintenance and repairs.

05.06 Mix and use mortar or concrete to regrout tile or repoint brickwork.
05.07 Prepare a home surface for finishing and apply the finish.
05.08 Make basic home electrical repairs.
05.09 Draw a layout for a home workshop with a suggested list of tools, machines, and materials.
05.10 Develop a schedule of routine preventative home maintenance practices.
05.11 Demonstrate technical consumer knowledge about home maintenance tools, materials, and machines.
05.12 List ways in which a personal computer may be used for home maintenance purposes.
05.13 Operate a computer utilizing a program related to home maintenance.

06.0 DEMONSTRATE A PRACTICAL TECHNOLOGICAL LITERACY ABOUT HOME MAINTENANCE--The student will be able to:

06.01 Outline major technological developments and events that have enhanced do-it-yourself home maintenance practices.
06.02 Identify recent advances in home maintenance technology.
06.03 Demonstrate a knowledge of problem-solving approaches to handle home maintenance needs.
06.04 Forecast a development or event in home maintenance technology or practices.
06.05 Make a technological decision related to home maintenance.
06.06 Define home maintenance.

CURRICULUM FRAMEWORK PROGRAM AREA: Technology Education

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

COURSE TITLE: Practical Power Mechanics and Energy

CODE NUMBER: Secondary 8600340 Postsecondary _______

Florida CIP 0821.0123PA

SECONDARY SCHOOL CREDITS 0.5 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS

APPLICABLE LEVEL(S): _____7-9 x9-12 _____Postsecondary Adult Vocational

_____ Postsecondary Vocational x Other 30, 31

CERTIFICATION COVERAGE: INDUS ARTS @ 4 @ 6 TRANSPORT @ 4
GEN SHOP @ 4 I ART-TEC 1 @ 2

I. MAJOR CONCEPTS/CONTENT: This course is designed to provide students with a practical knowledge concerning automotive maintenance based on the manufacturer's specifications.

The content includes, but is not limited to, the general study and applications of automotive maintenance related to the care and grooming of the interior and exterior of the body with emphases placed upon the commended maintenance of the manufacturer in the areas of engine, cooling system, electrical brakes, and etc.

II. LABORATORY ACTIVITIES: Learning activities are provided in a laboratory setting using hands-on experiences with the tools, materials, and devices appropriate to the course content.

III. SPECIAL NOTE: The Florida Technology Student Association (FL-TSA) is the appropriate student organization for providing leadership training experiences and for reinforcing specific technology skills. When provided, these activities are considered an integral part of this instructional course.

Proposed design code 242 as shown in DVACE joint Memorandum 92-37 of May 27, 1992, is appropriate for this course.

IV. INTENDED OUTCOMES: After successfully completing this course, the student will be able to:

01. Demonstrate proper and safe procedures while working with technological tools, apparatus, equipment, systems, and materials.
02. Exhibit positive human relations and leadership skills.
03. Demonstrate computer literacy and application.
04. Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.
05. Apply practical automotive maintenance skills.
06. Demonstrate a practical technological literacy about automotive maintenance.

05.05 Inspect, repair or rotate tires and wheels according to manufacturer's specifications.
05.06 Inspect, repair or replace wheel bearings.
05.07 Inspect, repair or add brake fluid to manufacturer's specifications.
05.08 Inspect A/C sight glass for proper performance of A/C.
05.09 Inspect, adjust or replace all drive belts to factory specifications.
05.10 Inspect, repair or replace all engine coolant and hoses as necessary.
05.11 Inspect and/or replace oil, filter and air cleaners to manufacturer's specifications.
05.12 Inspect and/or replace all fuel filters to manufacturer's specifications.
05.13 Inspect, repair or replace PCV and other emission control devices including vacuum lines to manufacturer's specifications.
05.14 Perform electrical test using a test light or VOM.
05.15 Inspect, test or replace battery.
05.16 Inspect, test and repair lighting system including headlights, parking lights, courtesy light system, brake lights, turning lights and backup lights.
05.17 Inspect, test, and repair accessories.
05.18 Inspect, gap or replace spark plugs to manufacturer's specifications.

06.0 DEMONSTRATE A PRACTICAL TECHNOLOGICAL LITERACY ABOUT AUTOMOTIVE MAINTENANCE--
The student will be able to:

06.01 Outline major technological developments and events in the history of the automotive industry.
06.02 Identify recent advances in the automotive industry.
06.03 Explain the problem-solving roles of the automotive industry in an American and world society.
06.04 Forecast a development or event in the automotive industry.
06.05 Make a technological decision related to the automotive industry.
06.06 Define automotive industry.

CURRICULUM FRAMEWORK PROGRAM AREA: Technology Education

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

COURSE TITLE: Practical Industrial Skills

CODE NUMBER: Secondary 8600330 Postsecondary ______

Florida CIP 0821.0121PA

SECONDARY SCHOOL CREDITS 0.5 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____7-9 __X__9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational __X__Other 30, 31

CERTIFICATION COVERAGE: INDUS ARTS @ 4 @ 6 WOOD WORK @ 4 TRANSPORT @ 4
GEN SHOP @ 4 METALS @ 4 I ART-TEC 1 @ 2
GRAPH ARTS @ 4 ELECTRICAL @ 4

I. MAJOR CONCEPTS/CONTENT: This course is designed to provide students with a practical foundation of knowledge and skills concerning industrial tools, materials, and processes.

The content includes, but is not limited to, the general study and application of common industrial tool skills, materials, processes, safety and leadership.

II. LABORATORY ACTIVITIES: Learning activities are provided in a laboratory setting using hands-on experiences with the tools, machines and materials appropriate to the selected course content.

III. SPECIAL NOTE: The Florida Technology Student Association (FL-TSA) is the appropriate student organization for providing leadership training experiences and for reinforcing specific technology skills. When provided, these activities are considered an integral part of this instructional course.

Proposed design code 242 as shown in DVACE joint Memorandum 92-37 of May 27, 1992, is appropriate for this course.

IV. INTENDED OUTCOMES: After successfully completing this course, the student will be able to:

01. Demonstrate proper and safe procedures while working with technological tools, apparatus, equipment, systems, and materials.
02. Exhibit positive human relations and leadership skills.
03. Demonstrate computer application and literacy.
04. Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.
05. Apply practical industrial skills.
06. Demonstrate a practical technological literacy about industrial skills.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education SECONDARY NUMBER: 8600330

COURSE TITLE: Practical Industrial Skills

01.0 DEMONSTRATE PROPER AND SAFE PROCEDURES WHILE WORKING WITH TECHNOLOGICAL TOOLS, APPARATUS, EQUIPMENT, SYSTEMS, AND MATERIALS--

The student will be able to:

01.01 Follow laboratory safety rules and procedures.
01.02 Demonstrate good housekeeping at work station within total laboratory.
01.03 Conduct laboratory activities and equipment operations in a safe manner.
01.04 Exercise care and respect for all tools, equipment, and materials.
01.05 Identify color-coding safety standards.
01.06 Safely use hand tools and power equipment.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 EXHIBIT POSITIVE HUMAN RELATIONS AND LEADERSHIP SKILLS--

The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Work cooperatively with others.

03.0 DEMONSTRATE COMPUTER APPLICATION AND LITERACY--

The student will be able to:

03.01 Define terms related to computer parts and usage.
03.02 List ways in which computer are used in technology.
03.03 Discuss advantages and disadvantages in the use of computers.
03.04 Demonstrate the application of a computer.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--

The student will be able to:

04.01 Use the features of books and reference materials, such as table of contents, preface, introduction, titles and subtitles, index, glossary, appendix, bibliography.
04.02 Read and follow complex written directions.
04.03 Find, understand, and apply information from a variety of sources (books, manuals, newspapers, periodicals, directories, reference works, computer printouts, and other printed matter or electronic sources such as video display terminals).
04.04 Use and expand general and specialized vocabulary (including abbreviations, acronyms, and concepts) as appropriate to subject areas studied at the grade level.
04.05 Write Standard English sentences with correct:
  -sentence structure;
  -verb forms;
  -punctuation, capitalization, possessives, plural forms, and other matters of mechanics;
  -word choice and spelling.
04.06 Answer and ask questions coherently and concisely, and follow spoken instructions.

04.07 Identify and comprehend the main and subordinate ideas in lectures and discussions, ask questions to clarify information heard, and report accurately what others have said.
04.08 Perform with accuracy the computations of addition, subtraction, multiplication, and division using natural numbers, fractions, decimals and integers.
04.09 Make and use measurements in both traditional and metric units.
04.10 Formulate and solve problems in mathematical terms, selecting appropriate approaches and tools (mental computation, trial and error, paper-and-pencil techniques, calculator, and computer).
04.11 Solve work-related problems involving the basic arithmetic operations using whole numbers, fractions, decimals, and percents.
04.12 Describe the role of observation and experimentation in the development of scientifc theories.
04.13 Gather scientific information through skills in laboratory, field and library work.
04.14 Draw conclusions or make inferences from data.
04.15 Apply basic scientific/technical solutions to the appropriate problems.

05.0 APPLY PRACTICAL INDUSTRIAL SKILLS--
The student will be able to:

05.01 Sketch, draw, and interpret working drawings.
05.02 Research and report on the properties of woods, metals, plastics, and composite industrial materials.
05.03 Design and construct one or more individual projects utilizing the materials, technical industrial skills and processes of woods, metals, and plastics technology.
05.04 Use measuring tools and instruments.
05.05 Participate in a small or large group to analyze and solve a problem utilizing practical industrial skills.
05.06 Apply a practical knowledge of the special finishing requirements and techniques for woods, metals, and plastics.
05.07 Apply a practical knowledge of the special bonding and fastening materials and techniques for woods, metals, and plastics.
05.08 Recognize and list several commercial products made of woods, metals, and plastics.
05.09 Identify or observe a variety of industrial skills applied in the local community.
05.10 Estimate the cost of a job requiring industrial skills, materials, and processes.
05.11 List groups or organizations that represent specialized industrial skills.
05.12 List ways in which computers are used in the application of industrial skills.
05.13 Operate a computer utilizing a program related to an industrial skill.

06.0 DEMONSTRATE A PRACTICAL TECHNOLOGICAL LITERACY ABOUT INDUSTRIAL SKILLS--
The student will be able to:

06.01 Outline major technological developments and events in the history of industrial skills.
06.02 Identify recent advances in industrial skills technology and practices.
06.03 Explain the problem-solving roles of industrial skills in an American technological society.
06.04 Forecast a development or event in industrial skills technology.
06.05 Make a technological decision related to industrial skills.
06.06 Define industrial skills.

CURRICULUM FRAMEWORK PROGRAM AREA: Technology Education

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

COURSE TITLE: Practical Applied Technology

CODE NUMBER: Secondary 8600350 Postsecondary _______

Florida CIP 0821.0125PA

SECONDARY SCHOOL CREDITS 1.0 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____ 7-9 X 9-12 _____ Postsecondary Adult Vocational

_____ Postsecondary Vocational X Other 30, 31

CERTIFICATION COVERAGE:

INDUS ARTS @ 4 @ 6	GEN SHOP @ 4
GRAPH ARTS @ 4	TRANSPORT @ 4
WOOD WORK @ 4	METALS @ 4
ELECTRICAL @ 4	I ART-TEC 1 @ 2

I. MAJOR CONCEPTS/CONTENT: This course is designed to provide students with an introductory understanding of the concepts of technology systems through the study of actual technology applications.

The content includes, but is not limited to, the general study and applications of mechanical, fluid, electrical, and thermal conepts. Content will also include computer applications for mechanical fluid, electrical, and thermal systems.

II. LABORATORY ACTIVITIES: Learning activities are provided in a laboratory setting using hands-on experiences with the tools and materials appropriate to the course content.

III. SPECIAL NOTE: The Florida Technology Student Association (FL-TSA) is the appropriate student organization for providing leadership training experiences and for reinforcing specific technology skills. When provided, these activities are considered an integral part of this instructional program.

Proposed design code 242 as shown in DVACE joint Memorandum 92-37 of May 27, 1992, is appropriate for this course.

IV. INTENDED OUTCOMES: After completing this course, the student will be able to:

01. Demonstrate proper and safe procedures while working with technological tools, apparatus, equipment, systems, and materials.
02. Exhibit positive human relations and leadership skills.
03. Demonstrate computer application and literacy.
04. Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.
05. Demonstrate and apply the design/problem-solving process.
06. Demonstrate a practical technological literacy.
07. Display an understanding and appreciation for the dignity and worth of honest labor.
08. Discuss individual interests and aptitudes as they relate to a career.
09. Demonstrate employability skills.
10. Demonstrate an understanding of entrepreneurship.
11. Demonstrate and apply mechanical system principles.
12. Demonstrate and apply fluid system principles.
13. Demonstrate and apply electrical system principles.

14. Demonstrate and apply thermal system principles.
15. Discuss the impact of technology on society and the environment.
16. Demonstrate the use of a computer to integrate and control a system composed of mechanical, fluid and electrical systems.
17. Demonstrate the use of sensors to control systems.
18. Demonstrate the use of fiber optics concepts.
19. Demonstrate the use of laser optics concepts.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education SECONDARY NUMBER: 8600350

COURSE TITLE: Practical Applied Technology

01.0 DEMONSTRATE PROPER AND SAFE PROCEDURES WHILE WORKING WITH TECHNOLOGICAL TOOLS, APPARATUS, EQUIPMENT, SYSTEMS, AND MATERIALS--The student will be able to:

01.01 Follow laboratory safety rules and procedures.
01.02 Demonstrate good housekeeping at work station within total laboratory.
01.03 Conduct laboratory activities and equipment operations in a safe manner.
01.04 Exercise care and respect for all tools, equipment, and materials.
01.05 Identify color-coding safety standards.
01.06 Safely use hand tools and power equipment.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 EXHIBIT POSITIVE HUMAN RELATIONS AND LEADERSHIP SKILLS--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Work cooperatively with others.

03.0 DEMONSTRATE COMPUTER APPLICATION AND LITERACY--The student will be able to:

03.01 Define terms related to computer parts and usage.
03.02 List ways in which computer are used in technology.
03.03 Discuss advantages and disadvantages in the use of computers.
03.04 Demonstrate the application of a computer.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Use the features of books and reference materials, such as table of contents, preface, introduction, titles and subtitles, index, glossary, appendix, bibliography.
04.02 Read and follow complex written directions.
04.03 Find, understand, and apply information from a variety of sources (books, manuals, newspapers, periodicals, directories, reference works, computer printouts, and other printed matter or electronic sources such as video display terminals).
04.04 Use and expand general and specialized vocabulary (including abbreviations, acronyms, and concepts) as appropriate to subject areas studied at the grade level.
04.05 Write Standard English sentences with correct:
  - sentence structure;
  - verb forms;
  - punctuation, capitalization, possessives, plural forms, and other matters of mechanics;
  - word choice and spelling.
04.06 Answer and ask questions coherently and concisely, and follow spoken instructions.

04.07 Identify and comprehend the main and subordinate ideas in lectures and discussions, ask questions to clarify information heard, and report accurately what others have said.
04.08 Perform with accuracy the computations of addition, subtraction, multiplication, and division using natural numbers, fractions, decimals and integers.
04.09 Make and use measurements in both traditional and metric units.
04.10 Formulate and solve problems in mathematical terms, selecting appropriate approaches and tools (mental computation, trial and error, paper-and-pencil techniques, calculator, and computer).
04.11 Solve work-related problems involving the basic arithmetic operations using whole numbers, fractions, decimals, and percents.
04.12 Describe the role of observation and experimentation in the development of scientifc theories.
04.13 Gather scientific information through skills in laboratory, field and library work.
04.14 Draw conclusions or make inferences from data.
04.15 Apply basic scientific/technical solutions to the appropriate problems.

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--

The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.

06.0 DEMONSTRATE TECHNOLOGICAL LITERACY--

The student will be able to:

06.01 Outline major historical technological developments or events.
06.02 Identify recent advances in technology.
06.03 Explain problem-solving roles of technology.
06.04 Forecast a technological decision.
06.05 Make a technological decision.
06.06 Define technology.

07.0 DISPLAY AN UNDERSTANDING AND APPRECIATION FOR THE DIGNITY AND WORTH OF HONEST LABOR--

The student will be able to:

07.01 Form an understanding and appreciation for work after listening to or observing technology workers.
07.02 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
07.03 Form an understanding and appreciation for the roles and work of co-workers.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--

The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--

The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.

09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--
The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 DEMONSTRATE AND APPLY MECHANICAL SYSTEM PRINCIPLES--
The student will be able to:

11.01 Assemble, operate, and identify the parts of a system which demonstrates mechanical system principles.
11.02 Demonstrate and apply principles of force, work, rate, resistance, energy, power, and force transformers relating to mechanical systems.

12.0 DEMONSTRATE AND APPLY FLUID SYSTEM PRINCIPLES--
The student will be able to:

12.01 Assemble, operate, and identify the parts of a system which demonstrates fluid system principles.
12.02 Demonstrate and apply principles of force, work, rate, resistance, energy, power, and force transformers relating to fluid systems.

13.0 DEMONSTRATE AND APPLY ELECTRICAL SYSTEM PRINCIPLES--
The student will be able to:

13.01 Assemble, operate, and identify the parts of a system which demonstrates electrical system principles.
13.02 Demonstrate and apply principles of force, work, rate, resistance, energy, power, and force transformers relating to electrical systems.

14.0 DEMONSTRATE AND APPLY THERMAL SYSTEM PRINCIPLES--
The student will be able to:

14.01 Assemble, operate, and identify the parts of a system which demonstrates thermal system principles.
14.02 Demonstrate and apply principles of force, work, rate, resistance, energy, power, and force transformers relating to thermal systems.

15.0 DISCUSS THE IMPACT OF TECHNOLOGY ON SOCIETY AND THE ENVIRONMENT--
The student will be able to:

15.01 Discuss the impact of technology, now and in the future.
15.02 Discuss the impacts of technology on work, job opportunities and careers.
15.03 Identify the scope of technological impacts.
15.04 Identify means of controlling the world impacts of technology.
15.06 Discuss expected and unexpected impacts of technology.
15.07 Discuss desired and undesired impacts of technology.
15.08 Prepare a report on the impact of technology.

16.0 DEMONSTRATE THE USE OF A COMPUTER TO INTEGRATE AND CONTROL A SYSTEM COMPOSED OF MECHANICAL, FLUID AND ELECTRICAL SYSTEMS--
The student will be able to:

16.01 Diagram an integrated system incorporating input, monitoring, controlling, output and feedback components.
16.02 Perform experiments using mechanical, fluid and electrical components in an integrated system.
16.03 Assemble, operate and identify the parts of computer controlled mechanical, fluid, and electrical systems.

17.0 DEMONSTRATE THE USE OF SENSORS TO CONTROL SYSTEMS--
The student will be able to:

17.01 Perform experiments using electronic sensors.
17.02 Assemble, operate and identify the types of sensors used in technology.
17.03 Write a report on the applications of sensors use in technology.

18.0 DEMONSTRATE THE USE OF FIBER OPTICS CONCEPTS--
The student will be able to:

18.01 Write a report on the application of fiber optics used in technology.
18.02 Perform fiber optics experiments.
18.03 Assemble, operate and identify the parts of a fiber optics system.

19.0 DEMONSTRATE THE USE OF LASER OPTICS CONCEPTS--
The student will be able to:

19.01 Write a report on the applications of laser optics used in technology.
19.02 Perform laser optics experiments.
19.03 Assemble, operate and identify the parts of a laser optics system.

CURRICULUM FRAMEWORK PROGRAM AREA: Technology Education

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

COURSE TITLE: Practical Applied Electronics

CODE NUMBER: Secondary 8600360 Postsecondary ____

Florida CIP 0821.0126PA

SECONDARY SCHOOL CREDITS 0.5 COLLEGE CREDITS ____ POSTSECONDARY ADULT VOCATIONAL CREDITS ____

APPLICABLE LEVEL(S): ____ 7-9 X 9-12 ____ Postsecondary Adult Vocational

____ Postsecondary Vocational X Other 30, 31

CERTIFICATION COVERAGE: I ART-TEC 1 @ 2 ELECTRICAL @ 4 @ 7 G
INDUS ARTS @ 4 @ 6 TEC ELEC @ 7 G
ELECTRONICS @ 7 G

I. MAJOR CONCEPTS/CONTENT: This course is designed to provide students with a practical foundation of knowledge and skills concerning electricity/electronics technology.

The content includes, but is not limited to, the general study and application of technology related to electricity/electronics, and leadership.

II. LABORATORY ACTIVITIES: Learning activities are provided in a laboratory setting using hands-on experiences with the tools and materials appropriate to the course content.

III. SPECIAL NOTE: The Florida Technology Student Association (FL-TSA) is the appropriate student organization for providing leadership training experiences and for reinforcing specific technology skills. When provided, these activities are considered an integral part of this instructional course.

Proposed design code 241 as shown in DVACE joint Memorandum 92-37 of May 27, 1992, is appropriate for this course.

IV. INTENDED OUTCOMES: After successfully completing this course, the student will be able to:

01. Demonstrate proper and safe procedures while working with technological tools, apparatus, equipment, systems, and materials.
02. Exhibit positive human relations and leadership skills.
03. Demonstrate computer application and literacy.
04. Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.
05. Apply practical electricity/electronics technology skills.
06. Demonstrate a practical technological literacy about electricity/electronics.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education PROGRAM NUMBER: 8600360

COURSE TITLE: Practical Applied Electronics

01.0 DEMONSTRATE PROPER AND SAFE PROCEDURES WHILE WORKING WITH TECHNOLOGICAL TOOLS, APPARATUS, EQUIPMENT, SYSTEMS, AND MATERIALS--
The student will be able to:

01.01 Follow laboratory safety rules and procedures.
01.02 Demonstrate good housekeeping at work station within total laboratory.
01.03 Conduct laboratory activities and equipment operations in a safe manner.
01.04 Exercise care and respect for all tools, equipment, and materials.
01.05 Identify color-coding safety standards.
01.06 Safely use hand tools and power equipment.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 EXHIBIT POSITIVE HUMAN RELATIONS AND LEADERSHIP SKILLS--
The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Work cooperatively with others.

03.0 DEMONSTRATE COMPUTER APPLICATION AND LITERACY--
The student will be able to:

03.01 Define terms related to computer parts and usage.
03.02 List ways in which computer are used in technology.
03.03 Discuss advantages and disadvantages in the use of computers.
03.04 Demonstrate the application of a computer.

04.0 APPLY BASIC SKILLS IN ENGLISH, MATHEMATICS AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--
The student will be able to:

04.01 Apply basic English skills of correct spelling, grammar, sentence structure and paragraph structure when completing written and verbal assignments.
04.02 Apply applicable basic mathematical skills of addition, subtraction, multiplication, division, fractions, percentages and measurements when completing written, verbal and performance assignments.
04.03 Apply applicable basic science principles and procedures of force, work, momentum, leverage, energy and power when completing written, verbal and performance assignments.

05.0 APPLY PRACTICAL ELECTRICITY/ELECTRONICS TECHNOLOGY SKILLS--
The student will be able to:

05.01 Identify and use the basic tools used in electricity/electronics.
05.02 Identify and use the basic instruments used in electricity/electronics.
05.03 Interpret electricity/electronics wiring diagrams and schematics.
05.04 Identify electricity/electronics components.
05.05 Explain the use of electricity/electronics components.
05.06 Explain the difference between electricity and electronics.

05.07 Describe and construct the following electricity circuits: switch controlled lampholder, three-way switch, four-way switch, split-wired receptacle, door buzzers, thermostat, timer, dimmer, photocell, and fluorescent lamp.

06.0 DEMONSTRATE A PRACTICAL TECHNOLOGICAL LITERACY ABOUT ELECTRICITY/ELECTRONICS--
The student will be able to:

06.01 Outline major technological developments and events in the history of electricity/electronics.
06.02 Identify recent advances in electricity/electronics.
06.03 Explain the problem-solving roles of electricity/electronics.
06.04 Forecast a development or event in electricity/electronics technology.
06.05 Make a technical decision related to electricity/electronics.
06.06 Define electricity/electronics technology.

CURRICULUM FRAMEWORK PROGRAM AREA: Technology Education

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

COURSE TITLE: Practical Digital Electronics

CODE NUMBER: Secondary 8600370 Post Secondary ____________

Florida CIP 0821.0127PA

SECONDARY SCHOOL CREDITS 1 COLLEGE CREDITS ____ POSTSECONDARY ADULT VOCATIONAL CREDITS ________

APPLICABLE LEVEL (S): ___ 7-9 X 9-12 _____ Postsecondary Adult Vocational

___ Postsecondary Vocational X Other 30, 31

CERTIFICATION COVERAGE: I ART-TEC 1 @ 2
INDUS ARTS @ 4 @ 6

I. MAJOR CONCEPTS/CONTENT: This course is designed to provide students with a practical foundation of knowledge and skills in digital electronics techniques.

The content includes, but is not limited to, Boolean logic, truth tables, various number systems, integrated circuit chips, flip-flops, counters, decoders, registers, microprocessors, mnemonics, addressing, and microprocessor architecture.

II. LABORATORY ACTIVITIES: Learning activities are provided in a laboratory setting using hands-on experience with the tools and materials appropriate to the course content.

III. SPECIAL NOTE: The Florida Technology Student Association (FL-TSA) is the appropriate student organization for providing leadership training experiences and for reinforcing specific technology skills. When provided, these activities are considered an integral part of this instructional course.

Proposed design code 241 as shown in DVACE joint Memorandum 92-37 of May 27, 1992, is appropriate for this course.

IV. INTENDED OUTCOMES: After successfully completing this course, the student will be able to:

01. Demonstrate proper and safe procedures while working with technological tools, apparatus, equipment, systems, and materials.
02. Exhibit positive human relations and leadership skills.
03. Demonstrate computer application and literacy.
04. Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.
05. Display effective laboratory skills and discuss modern electronic theory.
06. Demonstrate an understanding of various number systems.
07. Apply Boolean logic to electronic circuits.
08. Discuss multiplexers as circuit elements.
09. Identity demultiplexers as circuit elements.
10. Discuss the interaction of binary numbers and multiplexer/demultiplexers.
11. Use the "flip-flop" concept.
12. Describe shift-registers and their use.
13. Discuss counters and their uses.
14. Discuss basic microprocessor architectural concepts.
15. List microprocessor components.

16. Identify and use various addressing modes.
17. Identify 8 bit microprocessors.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education PROGRAM NUMBER: 8600370

COURSE TITLE: Practical Digital Electronics

01.0 DEMONSTRATE PROPER AND SAFE PROCEDURES WHILE WORKING WITH TECHNOLOGICAL TOOLS, APPARATUS, EQUIPMENT, SYSTEMS, AND MATERIALS--
The student will be able to:

01.01 Follow laboratory safety rules and procedures.
01.02 Demonstrate good housekeeping at work station within total laboratory.
01.03 Conduct laboratory activities and equipment operations in a safe manner.
01.04 Exercise care and respect for all tools, equipment, and materials.
01.05 Identify color-coding safety standards.
01.06 Safely use hand tools and power equipment.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 EXHIBIT POSITIVE HUMAN RELATIONS AND LEADERSHIP SKILLS--
The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Work cooperatively with others.

03.0 DEMONSTRATE COMPUTER APPLICATION AND LITERACY--
The student will be able to:

03.01 Define terms related to computer parts and usage.
03.02 List ways in which computer are used in technology.
03.03 Discuss advantages and disadvantages in the use of computers.
03.04 Demonstrate the application of a computer.

04.0 APPLY BASIC SKILLS IN ENGLISH, MATHEMATICS AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--
The student will be able to:

04.01 Apply basic English skills of correct spelling, grammar, sentence structure and paragraph structure when completing written and verbal assignments.
04.02 Apply applicable basic mathematical skills of addition, subtraction, multiplication, division, fractions, percentages and measurements when completing written, verbal and performance assignments.
04.03 Apply applicable basic science principles and procedures of force, work, momentum, leverage, energy and power when completing written, verbal and performance assignments.

05.0 DISPLAY EFFECTIVE LABORATORY SKILLS AND DISCUSS MODERN ELECTRONIC THEORY--
The student will be able to:

05.01 Compute using Boolean logic.
05.02 Use truth table.
05.03 State AND, NAND, OR, and NOR logic.
05.04 Solve problems involving a large number of logic gates.
05.05 Wire circuits as indicated.
05.06 Solve problems involving binary and hexadecimal numbers.
05.07 Explain flip-flop and counter circuits.

05.08 Discuss Microprocessor architectural concepts.
05.09 Write programs involving the accumulator, various registers, the program counter, and the stack pointer.
05.10 Discuss the microprocessor's addressing modes.

06.0 DEMONSTRATE AN UNDERSTANDING OF VARIOUS NUMBER SYSTEMS--
The student will be able to:

06.01 Convert base 10 number of binary numbers.
06.02 Convert binary number to base 10 numbers.
06.03 Add and subtract binary numbers.
06.04 Convert base 10 numbers to base 16 numbers.
06.05 Convert base 16 numbers to base 10 numbers.
06.06 Add and subtract base 16 numbers.

07.0 APPLY BOOLEAN LOGIC TO ELECTRONIC CIRCUITS--
The student will be able to:

07.01 Explain the use of inverters.
07.02 Explain AND and NAND logic.
07.03 Use AND and NAND truth tables in circuit design.
07.04 Explain OR and NOR logic.
07.05 Use OR and NOR truth tables in circuit design.

08.0 DISCUSS MULTIPLEXERS AS CIRCUIT ELEMENTS--
The student will be able to:

08.01 Discuss the multiplexer concept.
08.02 Discuss the basic structure of a multiplexer.
08.03 Discuss multiplexer logic and truth tables.
08.04 Set up practical multiplexer circuits.

09.0 IDENTIFY DEMULTIPLEXERS AS CIRCUIT ELEMENTS--
The student will be able to:

09.01 Explain the demultiplexer concept.
09.02 Explain the basic structure of a demultiplexer.
09.03 Explain the difference between multiplexers and demultiplexers.
09.04 Explain demultiplexer logic and truth tables.
09.05 Set up practical demultiplexer circuits.

10.0 DISCUSS THE INTERACTION OF BINARY NUMBERS AND MULTIPLEXER/DEMULTIPLEXERS--
The student will be able to:

10.01 Discuss the clock concept.
10.02 Discuss square wave pulses.
10.03 Solve time/clock pulse problems.
10.04 Investigate circuit fault problems.

11.0 USE THE "FLIP-FLOP" CONCEPT--
The student will be able to:

11.01 Discuss R-S and D type flip-flops.
11.02 Explain the difference between leading-edge and trailing-edge triggering.
11.03 Discuss in detail the J-K flip-flop.
11.04 Explain the meaning of a master-slave flip-flop.

12.0 DESCRIBE SHIFT-REGISTERS AND THEIR USE--
The student will be able to:

12.01 Explain the motion of binary numbers in shift registers.

12.02 Differentiate between serial in - serial out, serial in - parallel out, parallel in - serial out, and parrallel in - parallel out shift registers.
12.03 Explain time/clock - pulse diagrams.

13.0 DISCUSS COUNTERS AND THEIR USES--
The student will be able to:

13.01 Explain the difference between synchronous and asynchronous counters.
13.02 Integrate decoding gates with counters.
13.03 Discuss time/counting diagrams.
13.04 Construct in the laboratory various mod counters.

14.0 DISCUSS BASIC MICROPROCESSOR ARCHITECTURAL CONCEPTS--
The student will be able to:

14.01 Explain the meaning of microprocessor architecture.
14.02 Discuss addressable memory.
14.03 Discuss the concept of a register.

15.0 LIST MICROPROCESSOR COMPONENTS--
The student will be able to:

15.01 Differentiate between the accumulator, pwg ram counter, and stack pointer.
15.02 Differentiate between a status register, instruction register, and temporary data register.
15.03 Explain the use of an internal data bus.

16.0 IDENTIFY AND USE VARIOUS ADDRESSING MODES--
The student will be able to:

16.01 Explain inherent addressing.
16.02 Explain immediate addressing.
16.03 Explain direct addressing.
16.04 Explain indirect addressing.
16.05 Explain indexed addressing.
16.06 Explain relative addressing.

17.0 IDENTIFY 8 BIT MICROPROCESSORS--
The student will be able to:

17.01 Explain the block diagram of an 8 bit microprocessor.
17.02 Describe the 280 microprocessor and its instruction set.
17.03 Describe the 6802 microprocessor and its instruction set.

CURRICULUM FRAMEWORK PROGRAM AREA: Technology Education

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Principles of Aerospace Technology

CODE NUMBER: Secondary 8601600 Postsecondary ________

Florida CIP 0821.011000

SECONDARY
SCHOOL CREDITS 3 COLLEGE CREDITS ___ POSTSECONDARY ADULT
VOCATIONAL CREDITS ____

APPLICABLE LEVEL(S): 9-12 CERTIFICATION COVERAGE: I ART-TEC 1 @ 2
INDUS ARTS @ 4 @ 6

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to provide students with a foundation of knowledge and experiences in the study of Aerospace Technology.

The content includes, but is not limited to, a study of the technology of Aeronautics and the principles of flight, Aerospace Engineering, Space Flight, Space Systems Engineering, Space Exploration, the exploration and discovery of planetary systems including the technology of telemetry and astronomy, human life support systems, computer applications, and the development of Aerospace Technology as it is related to math and science. The content and activities will also include the study of occupations in Aerospace Technology, entrepreneurship, safety, and leadership skills.

Listed below are the courses that make up this program. Proposed design code 243 as shown in DVACE joint Memorandum 92-37 of May 27, 1992, is appropriate for this program.

8601610 - Basic Principles of Aerospace Technology
8601620 - Intermediate Principles of Aerospace Technology
8601630 - Advanced Principles of Aerospace Technology

II. LABORATORY ACTIVITIES: Instruction and learning activities are provided in a laboratory setting using hands-on experiences with the tools, materials, mathematical and scientific principles as they are applied to Aerospace Engineering Systems.

III. SPECIAL NOTE: The Florida Technology Student Association is the appropriate vocational student organization for providing leadership training experiences and for reinforcing specific technology skills. Where provided, these activities are considered and integral part of this instructional program.

The Intermediate and Advance courses in this program may articulate into postsecondary Tech-Prep 2 + 2 programs when taken in sequence. Tech-Prep 2 + 2 programs require articulation agreements between secondary and postsecondary educational agencies.

A proposed change to section 232.2467 F.S., Florida Gold Seal Vocational Endorsement would permit a student who "completed three credits in a sequential program of studies defined in an articulation agreement with a postsecondary institution(s) and leading to completion of a job preparatory program as defined by section 228.041 F.S." to be included. This would permit Technology Education students to participate in the Florida Gold Seal Vocational Endorsement.

IV. INTENDED OUTCOMES: After successfully completing this course of study, the student will be able to:

01. Demonstrate the ability to work safely with a variety of technologies.
02. Demonstrate interpersonal skills as they relate to the workplace.
03. Identify and apply methods of information acquisition and utilization.
04. Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.
05. Demonstrate and apply design/problem-solving processes.
06. Express an understanding of technological systems and their complex interrelationships.
07. Demonstrate the ability to properly identify, organize, plan, and allocate reources.
08. Discuss individual interests and aptitudes as they relate to a career.
09. Demonstrate employability skills.
10. Demonstrate an understanding of entrepreneurship.
11. Make an informed and meaningful career choice.
12. Provide evidence of research into the history and development of aviation, unmanned space flight, manned space exploration, and the exploration and discovery of the universe.
13. Demonstrate an understanding of computer-assisted word processing, data-base and spread-sheet applications for research and development projects.
14. Demonstrate an understanding of power systems including; jet engines, internal combustion engines, rocket engines, solar cells, and nuclear power.
15. Demonstrate technical knowledge of CAD as it relates to producing plans for aerospace projects.
16. Demonstrate an application of CAM as it relates to manufacturing processes for aerospace technology projects.
17. Demonstrate an understanding of electrical, mechanical, fluid, and pneumatic systems that could be used on/in space environments.
18. Demonstrate a knowledge of robotics.
19. Demonstrate a knowledge of computer control technology.
20. Perform processing skills on materials and composites as they relate to aerospace technology.
21. Utilize test facilities and equipment to determine suitability of materials and processes in an aerospace.
22. Develop test procedures for measuring and testing human performance in aerospace environments.
23. Produce aerospace vehicles to demonstrate the principles of flight.
24. Describe the aerospace environment.
25. Describe and demonstrate the principles of navigation.
26. Explore the role of civilian spacecraft in the exploration and colonization of space.
27. Demonstrate an understanding of the effects of flight as it relates to biotechnology.
28. Conduct a research and experimentation project related to aerospace technology.
29. Demonstrate appropriate skills in analyzing and evaluating technological advancements as reported by the media.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education SECONDARY NUMBER: 8601600

PROGRAM TITLE: Principles of Aerospace Technology

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.

04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.

04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.

04.04 Distinguish fact from opinion.

04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.

04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.

04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.

04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.

04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.

04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.

04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.

04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.

04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.

04.14 Use the mathematics of:
- integers, fractions, and decimals;
- ratios, proportions, and percentages;
- roots and powers;
- algebra;
- geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.

04.16 Use elementary concepts of probability and statistics.

04.17 Draw, read, and analyze graphs, charts, and tables.

04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.

04.19 Organize and communicate the results obtained by observation and experimentation.

04.20 Apply the basic principles of biology, physics, and chemistry. (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).

04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--

The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.

05.02 Propose solutions to given problems.

05.03 Design and implement the optimal solution to a given problem.

05.04 Document each step of the design/problem-solving process.

05.05 Demonstrate "Brainstorming" as a process to solve problems.

05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--

The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--

The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--

The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--

The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--

The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--

The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.

11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

12.0 PROVIDE EVIDENCE OF RESEARCH INTO THE HISTORY AND DEVELOPMENT OF AVIATION, UNMANNED SPACE FLIGHT, MANNED SPACE EXPLORATION, AND THE EXPLORATION AND DISCOVERY OF THE UNIVERSE--
The student will be able to:

12.01 Define aerospace.
12.02 Describe early attempts at flight prior to the Wright Brothers flight in 1902.
12.03 Outline the early attempts at heavier than air powered flight prior to WWI.
12.04 Describe the affect of airpower on the outcome of world conflict.
12.05 Outline the beginnings of commercial aviation.
12.06 Identify the early research centers for aeronautics in the US.
12.07 Describe the role of aviation research and development.
12.08 Outline the development of space exploration
12.09 Describe the role of NACA and NASA in the development of aeronautics and space exploration.
12.10 Prepare a forecast of aerospace developments, and interplanetary space travel.

13.0 DEMONSTRATE AN UNDERSTANDING OF COMPUTER ASSISTED WORD PROCESSING, DATA BASE AND SPREAD SHEET APPLICATIONS FOR RESEARCH AND DEVELOPMENT PROJECTS--
The student will be able to:
13.01 Demonstrate an ability to use a word processing program to prepare reports, outlines and descriptions of experiments, research and library projects related to aerospace technology.
13.02 Demonstrate an ability to use a computer based data base program to record, and communicate results from aerospace experiments.
13.03 Demonstrate an ability to use a spreadsheet application to record, compute and communicate mathematical and scientific data from an experimental aerospace activity.

14.0 DEMONSTRATE AN UNDERSTANDING OF POWER SYSTEMS INCLUDING, INTERNAL COMBUSTION ENGINES, JET ENGINES, ROCKET ENGINES, SOLAR CELLS AND NUCLEAR POWER USED IN AEROSPACE APPLICATIONS--
The student will be able to:

14.01 Demonstrate an ability to assemble and operate a model reciprocating airplane engine.
14.02 Name the basic types of engines used for aircraft propulsion.
14.03 Describe the change from linear motion to rotary motion in a reciprocating engine.
14.04 Identify the elements of an aircraft engine/fuel systems.
14.05 Describe the operation of aircraft turbine and ramjet engines.
14.06 Explain the application of Newton's laws to rocketry.
14.07 Diagram a rocket system including the airframe, propulsion, guidance and control.
14.08 Explain chemical propulsion systems.
14.09 Explain advanced propulsion systems including heavy lift launch systems, electrical propulsion, and nuclear propulsion.
14.10 Describe the use and operation solar cells to generate electrical power.
14.11 Perform experimental testing, including designing test devices to determine the power (thrust) of a model rocket engine.

15.0 DEMONSTRATE TECHNICAL KNOWLEDGE OF CAD AS IT IS RELATED TO PRODUCING PLANS FOR AEROSPACE PROJECTS--
The student will be able to:

15.01 Demonstrate the application of a computer and software program to develop a plan for an aerospace vehicle.

15.02 Demonstrate problem solving skills relative to computer aided drafting utilizing the techniques learned in this course.

16.0 DEMONSTRATE AN APPLICATION CAM AS IT RELATES TO MANUFACTURING PROCESSES FOR AEROSPACE TECHNOLOGY PROJECTS--
The student will be able to:

16.01 Demonstrate an ability to perform a milling, engraving or turning operation utilizing a computer assisted manufacturing program.
16.02 Demonstrate problem solving skills relative to computer assisted manufacturing utilizing the techniques learned in this course.

17.0 DEMONSTRATE A BASIC UNDERSTANDING OF ELECTRICAL, MECHANICAL, FLUID AND PNEUMATIC SYSTEMS THAT COULD BE USED ON/IN AEROSPACE ENVIRONMENTS--
The student will be able to:

17.01 Demonstrate the concepts of force, work, rate, resistance, energy and power through the use of various mechanical sub systems to include: gears, belts, valves, chains, pulleys, screws, cams, linkages, rods, and sprockets or mechanical trainers.
17.02 Demonstrate the concepts of force, work rate, resistance, and power through the use of various fluid subsystems to include: fluid manometers, hydraulic lifts, pipes, valves, tanks, air gauges of hydraulic trainers, and pneumatic trainers.
17.03 Demonstrate the concepts of force, work, rate, resistance, energy, and power through the use of various electrical sub systems to include: conductors, control elements, electrical loads, voltage sources, current sources, circuits, components, and measurement equipment, or electrical/electronic trainers.
17.04 Demonstrate problem solving skills relative to electrical, mechanical or fluid systems related to aerospace technology experiments.

18.0 DEMONSTRATE A KNOWLEDGE OF ROBOTICS--
The student will be able to:

18.01 Identify three types of robots.
18.02 State the function of effectors, sensors, controllers, and auxiliary parts in robotics system.
18.03 Program a robot using computer to perform a specific task using machine language.
18.04 Explain how robotics technology is used in the space program.
18.05 Demonstrate problem solving skills using robotics technology as it applies to aerospace technology experiments and programs.
18.06 Forecast how robotics technology will be used in the exploration of space, space colonization or interplanetary space travel.

19.0 DEMONSTRATE A KNOWLEDGE OF COMPUTER CONTROL TECHNOLOGY--
The student will be able to:

19.01 Write programs in Logo Computer Language.
19.02 Demonstrate an ability to develop programs to control simple machines using Logo programming language.

20.0 PERFORM PROCESSING SKILLS ON MATERIALS AND COMPOSITES AS THEY RELATE TO AEROSPACE TECHNOLOGY--
The student will be able to:

20.01 Identify tools, machines and equipment in the laboratory and explain their functions.
20.02 Select appropriate tools, machines and equipment to accomplish a given task.
20.03 Demonstrate safe and correct use of tools, machines and equipment.

20.04 Identify various industrial raw materials.
20.05 Identify and explain the composition of composite materials.
20.06 Perform processing skills on materials and composites as needed to develop aerospace vehicles, models experimental fixtures and apparatus.

21.0 UTILIZE TEST FACILITIES AND EQUIPMENT TO DETERMINE SUITABILITY OF MATERIALS AND PROCESSES TO AN AEROSPACE ENVIRONMENT--
The student will be able to:

21.01 Use appropriate test instruments, equipment and machines to test materials and processes for strength, compressibility, heat retention, insulating properties, conductivity or other properties as necessary to the solution of aerospace design and engineering problems.
21.02 Use test apparatus to conduct testing of processes, procedures and equipment developed in design and engineering problems.
21.03 Demonstrate problem solving using test equipment, machines and instruments to determine suitability of materials and processes developed in research and development activities of aerospace engineering problems.
21.04 Explain the requirements of the aerospace industry for quality control and testing of materials and processes as it relates to product development, safety and performance of aerospace products, and vehicles.

22.0 DEVELOP TEST PROCEDURES FOR MEASURING AND TESTING HUMAN PERFORMANCE IN AEROSPACE ENVIRONMENTS--
The student will be able to:

22.01 Construct human data charts to determine the variation in body dimensions of human subjects.
22.02 Evaluate products and fixtures used in aerospace environments and assess their suitability for human use.
22.03 Construct human manikins for use in determining human size as related to aerospace environments.
22.04 Develop test procedures for measuring human performance including but not limited to: visual perception, ability to withstand stress, ability to live in a restricted environment, requirements for nutrition, exercise and other physical needs as may be determined by research and development of aerospace projects.
22.05 Demonstrate an ability to control an aircraft in flight by using a computer flight simulator.
22.06 Demonstrate an ability to control an aircraft in flight using a radio control system.

23.0 PRODUCE AEROSPACE VEHICLES TO DEMONSTRATE THE PRINCIPLES OF FLIGHT--
The student will be able to:

23.01 Identify the structural components of aircraft.
23.02 Construct flying models of lighter than air craft.
23.03 Construct flying models of kites to demonstrate the properties of lift.
23.04 Construct flying models of a glider to specific design specifications.
23.05 Construct flying models of a powered aircraft, using control surfaces to control flight characteristics of pitch, yaw and roll.
23.06 Construct a flying model of a research aircraft of ones own design.
23.07 Construct a flying model of an aircraft to demonstrate the use of radio control technology.
23.08 Design and build a model single stage rocket.
23.09 Construct a model rocket designed to carry a specific payload.
23.10 Construct a model rocket that utilizes multi staging.

23.11 Construct a model rocket launch control system.
23.12 Design and build an alternate recovery system for recovery of a rocket payload.
23.13 Design, build and test a boost glider model rocket system.
23.14 Plan, organize, and control a model rocketry contest.

24.0 DESCRIBE THE AEROSPACE ENVIRONMENT--
The student will be able to:

24.01 Identify atmospheric regions and elements.
24.02 Describe the roles of water and particulate matter in the atmosphere.
24.03 Describe and identify the elements of the atmosphere in motion. Define weather.
24.04 Explain the role weather forecasting has as it related to aerospace technology.
24.05 Demonstrate an understanding of the principle bodies of the universe.
24.06 Utilize astronomical principles, and technology to study the solar systems.
24.07 Develop a radio telemetry system to measure temperature, pressure, humidity, or acceleration during a rocket flight.
24.08 Define interplanetary space.
24.09 Describe the physical properties of interplanetary space including the structure of the sun, its formation and future, magnetosphere and solar winds, radiation belts, cislunar space and meteoroids.
24.10 Describe interstellar and intragalactic space.

25.0 DESCRIBE AND DEMONSTRATE PRINCIPLES OF NAVIGATION--
The student will be able to:

25.01 Be able to describe navigation principles as they relate to aeronautical travel.
25.02 Demonstrate and ability to read and use an aeronautical navigational chart.
25.03 Examine navigational technologies and systems as they relate to aeronautical systems.
25.04 Complete a flight plan for a fixed wing aircraft, from destination to destination.
25.05 Demonstrate an understanding and application of mathematical applications as they relate to determining space flight mechanics.
25.06 Demonstrate an ability to compute a space flight orbit.
25.07 Define geostationary, polar and sunsynchronous orbits.

26.0 EXPLORE THE ROLE OF CIVILIAN SPACECRAFT IN THE EXPLORATION AND COLONIZATION OF SPACE--
The student will be able to:

26.01 Participate in the development of a study for a model of manned interplanetary space travel.
26.02 Develop a plan for scientific research to be performed on a space station facility.
26.03 Develop a plan for flight crew training for a manned space flight.
26.04 Research, develop, plan, and build model structures of space colonization structures.
26.05 Develop plans, models and a visual presentation of a manned space flight to a distant planet in the solar system.
26.06 Examine methods of sending and receiving messages and controlling telemetry from space.

27.0 DEMONSTRATE AN UNDERSTANDING OF THE EFFECTS OF FLIGHT AS IT RELATES TO BIOTECHNOLOGY--
The student will be able to:

27.01 Demonstrate the effects of living in space on plant and animal organisms.
27.02 Plan and build model space craft to demonstrate possible solutions to space travel, extended space living quarters, and providing a living space environment for human exploration of the universe.
27.03 Plan and produce a model system for providing life support systems for space travel.
27.04 Research the biological effects of extended space flight.
27.05 Participate in a space flight simulation.

28.0 CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT RELATED TO AEROSPACE TECHNOLOGY--
The student will be able to:

28.01 Identify a problem.
28.02 State a need to research the problem.
28.03 Form a hypothesis about the problem.
28.04 Plan the procedures for researching the problem.
28.05 Conduct the research following the planned procedures.
28.06 Present the research findings in a seminar.
28.07 State conclusions based on the research findings.

29.0 DEMONSTRATE APPROPRIATE SKILLS IN ANALYZING AND EVALUATING TECHNOLOGICAL ADVANCEMENTS AS REPORTED BY THE MEDIA--
The student will be able to:

29.01 Distinguish between verifying facts and claims.
29.02 Determine reliability sources.
29.03 Determine accuracy of source.
29.04 Detecting bias.
29.05 Identify stated and unstated assumptions.
29.06 Recognizing logical inconsistencies.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education
COURSE CREDIT: 1

PROGRAM TITLE: Principles of Aerospace Technology
PROGRAM NUMBER: 8601600

COURSE TITLE: Basic Principles of Aerospace Technology
COURSE NUMBER: 8601610

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--
The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
-integers, fractions, and decimals;
-ratios, proportions, and percentages;
-roots and powers;
-algebra;
-geometry.
04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry. (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "Brainstorming" as a process to solve problems.

05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--
The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--
The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
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The student will be able to:

08.01 Describe individual strengths and weaknesses.
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The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
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10.04 Identify the risks involved in ownership of a business.
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10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--
The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

12.0 PROVIDE EVIDENCE OF RESEARCH INTO THE HISTORY AND DEVELOPMENT OF AVIATION, UNMANNED SPACE FLIGHT, MANNED SPACE EXPLORATION, AND THE EXPLORATION AND DISCOVERY OF THE UNIVERSE--
The student will be able to:

12.01 Define aerospace.
12.02 Describe early attempts at flight prior to the Wright Brothers flight in 1902.
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12.04 Describe the affect of airpower on the outcome of world conflict.
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12.07 Describe the role of aviation research and development.
12.08 Outline the development of space exploration
12.09 Describe the role of NACA and NASA in the development of aeronautics and space exploration.
12.10 Prepare a forecast of aerospace developments, and interplanetary space travel.

13.0 DEMONSTRATE AN UNDERSTANDING OF COMPUTER ASSISTED WORD PROCESSING, DATA BASE AND SPREAD SHEET APPLICATIONS FOR RESEARCH AND DEVELOPMENT PROJECTS--
The student will be able to:

13.01 Demonstrate an ability to use a word processing program to prepare reports, outlines and descriptions of experiments, research and library projects related to aerospace technology.
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The student will be able to:

14.01 Demonstrate an ability to assemble and operate a model reciprocating airplane engine.
14.02 Name the basic types of engines used for aircraft propulsion.
14.03 Describe the change from linear motion to rotary motion in a reciprocating engine.
14.04 Identify the elements of an aircraft engine/fuel systems.
14.05 Describe the operation of aircraft turbine and ramjet engines.
14.06 Explain the application of Newton's laws to rocketry.
14.07 Diagram a rocket system including the airframe, propulsion, guidance and control.
14.08 Explain chemical propulsion systems.
14.09 Explain advanced propulsion systems including heavy lift launch systems, electrical propulsion, and nuclear propulsion.
14.10 Describe the use and operation solar cells to generate electrical power.
14.11 Perform experimental testing, including designing test devices to determine the power (thrust) of a model rocket engine.

15.0 DEMONSTRATE TECHNICAL KNOWLEDGE OF CAD AS IT IS RELATED TO PRODUCING PLANS FOR AEROSPACE PROJECTS--
The student will be able to:

15.01 Demonstrate the application of a computer and software program to develop a plan for an aerospace vehicle.
15.02 Demonstrate problem solving skills relative to computer aided drafting utilizing the techniques learned in this course.

16.0 DEMONSTRATE AN APPLICATION OF CAM AS IT RELATES TO MANUFACTURING PROCESSES FOR AEROSPACE TECHNOLOGY PROJECTS--
The student will be able to:

16.01 Demonstrate an ability to perform a milling, engraving or turning operation utilizing a computer assisted manufacturing program.
16.02 Demonstrate problem solving skills relative to computer assisted manufacturing utilizing the techniques learned in this course.

18.0 DEMONSTRATE A KNOWLEDGE OF ROBOTICS--
The student will be able to:

18.01 Identify three types of robots.
18.02 State the function of effectors, sensors, controllers, and auxiliary parts in robotics system.
18.03 Program a robot using computer to perform a specific task using machine language.
18.04 Explain how robotics technology is used in the space program.

18.05 Demonstrate problem solving skills using robotics technology as it applies to aerospace technology experiments and programs.
18.06 Forecast how robotics technology will be used in the exploration of space, space colonization or interplanetary space travel.

19.0 DEMONSTRATE A KNOWLEDGE OF COMPUTER CONTROL TECHNOLOGY--
The student will be able to:

19.01 Write programs in Logo Computer Language.
19.02 Demonstrate an ability to develop programs to control simple machines using Logo programming language.

20.0 PERFORM PROCESSING SKILLS ON MATERIALS AND COMPOSITES AS THEY RELATE TO AEROSPACE TECHNOLOGY--
The student will be able to:

20.01 Identify tools, machines and equipment in the laboratory and explain their functions.
20.02 Select appropriate tools, machines and equipment to accomplish a given task.
20.03 Demonstrate safe and correct use of tools, machines and equipment.
20.04 Identify various industrial raw materials.
20.05 Identify and explain the composition of composite materials.
20.06 Perform processing skills on materials and composites as needed to develop aerospace vehicles, models experimental fixtures and apparatus.

23.0 PRODUCE AEROSPACE VEHICLES TO DEMONSTRATE THE PRINCIPLES OF FLIGHT--
The student will be able to:

23.01 Identify the structural components of aircraft.
23.02 Construct flying models of lighter than air craft.
23.03 Construct flying models of kites to demonstrate the properties of lift.
23.04 Construct flying models of a glider to specific design specifications.

23.05 Construct flying models of a powered aircraft, using control surfaces to control flight characteristics of pitch, yaw and roll.
23.06 Construct a flying model of a research aircraft of ones own design.
23.07 Construct a flying model of an aircraft to demonstrate the use of radio control technology.
23.08 Design and build a model single stage rocket.
23.09 Construct a model rocket designed to carry a specific payload.
23.10 Construct a model rocket that utilizes multi staging.
23.11 Construct a model rocket launch control system.
23.12 Design and build an alternate recovery system for recovery of a rocket payload.
23.13 Design, build and test a boost glider model rocket system.
23.14 Plan, organize, and control a model rocketry contest.

24.0 DESCRIBE THE AEROSPACE ENVIRONMENT--
The student will be able to:

24.01 Identify atmospheric regions and elements.
24.02 Describe the roles of water and particulate matter in the atmosphere.
24.03 Describe and identify the elements of the atmosphere in motion. Define weather.
24.04 Explain the role weather forecasting has as it related to aerospace technology.
24.05 Demonstrate an understanding of the principle bodies of the universe.
24.06 Utilize astronomical principles, and technology to study the solar systems.
24.07 Develop a radio telemetry system to measure temperature, pressure, humidity, or acceleration during a rocket flight.
24.08 Define interplanetary space.
24.09 Describe the physical properties of interplanetary space including the structure of the sun, its formation and future, magnetosphere and solar winds, radiation belts, cislunar space and meteoroids.
24.10 Describe interstellar and intragalactic space.

26.0 EXPLORE THE ROLE OF CIVILIAN SPACECRAFT IN THE EXPLORATION AND COLONIZATION OF SPACE--
The student will be able to:

26.01 Participate in the development of a study for a model of manned interplanetary space travel.
26.02 Develop a plan for scientific research to be performed on a space station facility.
26.03 Develop a plan for flight crew training for a manned space flight.
26.04 Research, develop, plan, and build model structures of space colonization structures.
26.05 Develop plans, models and a visual presentation of a manned space flight to a distant planet in the solar system.
26.06 Examine methods of sending and receiving messages and controlling telemetry from space.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education
COURSE CREDIT: 1

PROGRAM TITLE: Principles of Aerospace Technology
PROGRAM NUMBER: 8601600

COURSE TITLE: Intermediate Principles of Aerospace Technology
COURSE NUMBER: 8601620

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--
The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
  -integers, fractions, and decimals;
  -ratios, proportions, and percentages;
  -roots and powers;
  -algebra;
  -geometry.
04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry. (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "Brainstorming" as a process to solve problems.

05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--
The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--
The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--
The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--
The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--
The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

15.0 DEMONSTRATE TECHNICAL KNOWLEDGE OF CAD AS IT IS RELATED TO PRODUCING PLANS FOR AEROSPACE PROJECTS--
The student will be able to:

15.01 Demonstrate the application of a computer and software program to develop a plan for an aerospace vehicle.
15.02 Demonstrate problem solving skills relative to computer aided drafting utilizing the techniques learned in this course.

16.0 DEMONSTRATE AN APPLICATION OF CAM AS IT RELATES TO MANUFACTURING PROCESSES FOR AEROSPACE TECHNOLOGY PROJECTS--
The student will be able to:

16.01 Demonstrate an ability to perform a milling, engraving or turning operation utilizing a computer assisted manufacturing program.
16.02 Demonstrate problem solving skills relative to computer assisted manufacturing utilizing the techniques learned in this course.

17.0 DEMONSTRATE A BASIC UNDERSTANDING OF ELECTRICAL, MECHANICAL, FLUID AND PNEUMATIC SYSTEMS THAT COULD BE USED ON/IN AEROSPACE ENVIRONMENTS--
The student will be able to:

17.01 Demonstrate the concepts of force, work, rate, resistance, energy and power through the use of various mechanical sub systems to include: gears, belts, valves, chains, pulleys, screws, cams, linkages, rods, and sprockets or mechanical trainers.
17.02 Demonstrate the concepts of force, work rate, resistance, and power through the use of various fluid subsystems to include: fluid manometers, hydraulic lifts, pipes, valves, tanks, air gauges of hydraulic trainers, and pneumatic trainers.
17.03 Demonstrate the concepts of force, work, rate, resistance, energy, and power through the use of various electrical sub systems to include: conductors, control elements, electrical loads, voltage sources, current sources, circuits, components, and measurement equipment, or electrical/electronic trainers.
17.04 Demonstrate problem solving skills relative to electrical, mechanical or fluid systems related to aerospace technology experiments.

18.0 DEMONSTRATE A KNOWLEDGE OF ROBOTICS--
The student will be able to:

18.01 Identify three types of robots.
18.02 State the function of effectors, sensors, controllers, and auxiliary parts in robotics system.
18.03 Program a robot using computer to perform a specific task using machine language.
18.04 Explain how robotics technology is used in the space program.

18.05 Demonstrate problem solving skills using robotics technology as it applies to aerospace technology experiments and programs.
18.06 Forecast how robotics technology will be used in the exploration of space, space colonization or interplanetary space travel.

19.0 DEMONSTRATE A KNOWLEDGE OF COMPUTER CONTROL TECHNOLOGY--
The student will be able to:

19.01 Write programs in Logo Computer Language.
19.02 Demonstrate an ability to develop programs to control simple machines using Logo programming language.

20.0 PERFORM PROCESSING SKILLS ON MATERIALS AND COMPOSITES AS THEY RELATE TO AEROSPACE TECHNOLOGY--
The student will be able to:

20.01 Identify tools, machines and equipment in the laboratory and explain their functions.
20.02 Select appropriate tools, machines and equipment to accomplish a given task.
20.03 Demonstrate safe and correct use of tools, machines and equipment.
20.04 Identify various industrial raw materials.
20.05 Identify and explain the composition of composite materials.
20.06 Perform processing skills on materials and composites as needed to develop aerospace vehicles, models experimental fixtures and apparatus.

22.0 DEVELOP TEST PROCEDURES FOR MEASURING AND TESTING HUMAN PERFORMANCE IN AEROSPACE ENVIRONMENTS--
The student will be able to:

22.01 Construct human data charts to determine the variation in body dimensions of human subjects.
22.02 Evaluate products and fixtures used in aerospace environments and assess their suitability for human use.
22.03 Construct human manikins for use in determining human size as related to aerospace environments.
22.04 Develop test procedures for measuring human performance including but not limited to: visual perception, ability to withstand stress, ability to live in a restricted environment, requirements for nutrition, exercise and other physical needs as may be determined by research and development of aerospace projects.
22.05 Demonstrate an ability to control an aircraft in flight by using a computer flight simulator.
22.06 Demonstrate an ability to control an aircraft in flight using a radio control system.

23.0 PRODUCE AEROSPACE VEHICLES TO DEMONSTRATE THE PRINCIPLES OF FLIGHT--
The student will be able to:

23.01 Identify the structural components of aircraft.
23.02 Construct flying models of lighter than air craft.
23.03 Construct flying models of kites to demonstrate the properties of lift.
23.04 Construct flying models of a glider to specific design specifications.
23.05 Construct flying models of a powered aircraft, using control surfaces to control flight characteristics of pitch, yaw and roll.
23.06 Construct a flying model of a research aircraft of ones own design.
23.07 Construct a flying model of an aircraft to demonstrate the use of radio control technology.
23.08 Design and build a model single stage rocket.
23.09 Construct a model rocket designed to carry a specific payload.
23.10 Construct a model rocket that utilizes multi staging.
23.11 Construct a model rocket launch control system.
23.12 Design and build an alternate recovery system for recovery of a rocket payload.
23.13 Design, build and test a boost glider model rocket system.

23.14 Plan, organize, and control a model rocketry contest

25.0 DESCRIBE AND DEMONSTRATE PRINCIPLES OF NAVIGATION--
The student will be able to:

25.01 Be able to describe navigation principles as they relate to aeronautical travel.
25.02 Demonstrate and ability to read and use an aeronautical navigational chart.
25.03 Examine navigational technologies and systems as they relate to aeronautical systems.
25.04 Complete a flight plan for a fixed wing aircraft, from destination to destination.
25.05 Demonstrate an understanding and application of mathematical applications as they relate to determining space flight mechanics.
25.06 Demonstrate an ability to compute a space flight orbit.
25.07 Define geostationary, polar and sunsynchronous orbits.

29.0 DEMONSTRATE APPROPRIATE SKILLS IN ANALYZING AND EVALUATING TECHNOLOGICAL ADVANCEMENTS AS REPORTED BY THE MEDIA--
The student will be able to:

29.01 Distinguish between verifying facts and claims.
29.02 Determine reliability sources.
29.03 Determine accuracy of source.
29.04 Detecting bias.
29.05 Identify stated and unstated assumptions.
29.06 Recognizing logical inconsistencies.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education COURSE CREDIT: 1

PROGRAM TITLE: Principles of Aerospace Technology PROGRAM NUMBER: 8601600

COURSE TITLE: Advanced Principles of Aerospace Technology COURSE NUMBER: 8601630

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
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The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
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04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
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05.01 Describe and explain steps in the design/problem-solving process.
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05.03 Design and implement the optimal solution to a given problem.
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06.07 Forecast a technological development or event.
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09.04 Complete a job application form correctly.
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The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
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10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--
The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

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The student will be able to:

15.01 Demonstrate the application of a computer and software program to develop a plan for an aerospace vehicle.
15.02 Demonstrate problem solving skills relative to computer aided drafting utilizing the techniques learned in this course.

16.0 DEMONSTRATE AN APPLICATION OF CAM AS IT RELATES TO MANUFACTURING PROCESSES FOR AEROSPACE TECHNOLOGY PROJECTS--
The student will be able to:

16.01 Demonstrate an ability to perform a milling, engraving or turning operation utilizing a computer assisted manufacturing program.
16.02 Demonstrate problem solving skills relative to computer assisted manufacturing utilizing the techniques learned in this course.

17.0 DEMONSTRATE A BASIC UNDERSTANDING OF ELECTRICAL, MECHANICAL, FLUID AND PNEUMATIC SYSTEMS THAT COULD BE USED ON/IN AEROSPACE ENVIRONMENTS--
The student will be able to:

17.01 Demonstrate the concepts of force, work, rate, resistance, energy and power through the use of various mechanical sub systems to include: gears, belts, valves, chains, pulleys, screws, cams, linkages, rods, and sprockets or mechanical trainers.
17.02 Demonstrate the concepts of force, work rate, resistance, and power through the use of various fluid subsystems to include: fluid manometers, hydraulic lifts, pipes, valves, tanks, air gauges of hydraulic trainers, and pneumatic trainers.
17.03 Demonstrate the concepts of force, work, rate, resistance, energy, and power through the use of various electrical sub systems to include: conductors, control elements, electrical loads, voltage sources, current sources, circuits, components, and measurement equipment, or electrical/electronic trainers.
17.04 Demonstrate problem solving skills relative to electrical, mechanical or fluid systems related to aerospace technology experiments.

18.0 DEMONSTRATE A KNOWLEDGE OF ROBOTICS--
The student will be able to:

18.01 Identify three types of robots.
18.02 State the function of effectors, sensors, controllers, and auxiliary parts in robotics system.
18.03 Program a robot using computer to perform a specific task using machine language.
18.04 Explain how robotics technology is used in the space program.
18.05 Demonstrate problem solving skills using robotics technology as it applies to aerospace technology experiments and programs.
18.06 Forecast how robotics technology will be used in the exploration of space, space colonization or interplanetary space travel.

19.0 DEMONSTRATE A KNOWLEDGE OF COMPUTER CONTROL TECHNOLOGY--
The student will be able to:

19.01 Write programs in Logo Computer Language.
19.02 Demonstrate an ability to develop programs to control simple machines using Logo programming language.

20.0 PERFORM PROCESSING SKILLS ON MATERIALS AND COMPOSITES AS THEY RELATE TO AEROSPACE TECHNOLOGY--
The student will be able to:

20.01 Identify tools, machines and equipment in the laboratory and explain their functions.
20.02 Select appropriate tools, machines and equipment to accomplish a given task.
20.03 Demonstrate safe and correct use of tools, machines and equipment.
20.04 Identify various industrial raw materials.
20.05 Identify and explain the composition of composite materials.
20.06 Perform processing skills on materials and composites as needed to develop aerospace vehicles, models experimental fixtures and apparatus.

21.0 UTILIZE TEST FACILITIES AND EQUIPMENT TO DETERMINE SUITABILITY OF MATERIALS AND PROCESSES TO AN AEROSPACE ENVIRONMENT--
The student will be able to:

21.01 Use appropriate test instruments, equipment and machines to test materials and processes for strength, compressibility, heat retention, insulating properties, conductivity or other properties as necessary to the solution of aerospace design and engineering problems.
21.02 Use test apparatus to conduct testing of processes, procedures and equipment developed in design and engineering problems.
21.03 Demonstrate problem solving using test equipment, machines and instruments to determine suitability of materials and processes developed in research and development activities of aerospace engineering problems.
21.04 Explain the requirements of the aerospace industry for quality control and testing of materials and processes as it relates to product development, safety and performance of aerospace products, and vehicles.

22.0 DEVELOP TEST PROCEDURES FOR MEASURING AND TESTING HUMAN PERFORMANCE IN AEROSPACE ENVIRONMENTS--
The student will be able to:

22.01 Construct human data charts to determine the variation in body dimensions of human subjects.
22.02 Evaluate products and fixtures used in aerospace environments and assess their suitability for human use.
22.03 Construct human manikins for use in determining human size as related to aerospace environments.
22.04 Develop test procedures for measuring human performance including but not limited to: visual perception, ability to withstand stress, ability to live in a restricted environment, requirements for nutrition, exercise and other physical needs as may be determined by research and development of aerospace projects.
22.05 Demonstrate an ability to control an aircraft in flight by using a computer flight simulator.
22.06 Demonstrate an ability to control an aircraft in flight using a radio control system.

27.0 DEMONSTRATE AN UNDERSTANDING OF THE EFFECTS OF FLIGHT AS IT RELATES TO BIOTECHNOLOGY--

The student will be able to:

27.01 Demonstrate the effects of living in space on plant and animal organisms.
27.02 Plan and build model space craft to demonstrate possible solutions to space travel, extended space living quarters, and providing a living space environment for human exploration of the universe.
27.03 Plan and produce a model system for providing life support systems for space travel.
27.04 Research the biological effects of extended space flight.
27.05 Participate in a space flight simulation.

28.0 CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT RELATED TO AEROSPACE TECHNOLOGY--

The student will be able to:

28.01 Identify a problem.
28.02 State a need to research the problem.
28.03 Form a hypothesis about the problem.
28.04 Plan the procedures for researching the problem.
28.05 Conduct the research following the planned procedures.
28.06 Present the research findings in a seminar.
28.07 State conclusions based on the research findings.

CURRICULUM FRAMEWORK PROGRAM AREA: Technology Education

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Principles of Construction Technology

CODE NUMBER: Secondary 8600700 Postsecondary ______

Florida CIP 0821.010200

SECONDARY SCHOOL CREDITS 3 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____ 7-9 X 9-12 ____ Postsecondary Adult Vocational

______ Postsecondary Vocational X Other 30, 31

CERTIFICATION COVERAGE:
INDUS ARTS @ 4 @ 6
GEN SHOP @ 4
CARPENTRY @ 7 G
I ART-TEC 1 @2
WOODWORK @ 4
TEC CONSTR @ 7 G
BLDG CONSTR @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to provide students with a foundation of knowledge and technically oriented experiences in the study of construction technology.

The content includes, but is not limited to, a study of the tools, materials, processes, and technical skills of construction technology. The content and activities will also include the study of entrepreneurship, safety, and leadership skills.

Listed below are the courses that make up this program. Proposed design code 243 as shown in DVACE joint Memorandum 92-37 of May 27, 1992, is appropriate for this program.

8600710	Basic Principles of Construction Technology
8600720	Intermediate Principles of Construction Technology
8600730	Advanced Principles of Construction Technology

II. LABORATORY ACTIVITIES: Instruction and learning activities are provided in a laboratory setting using hands-on experiences with the tools and materials appropriate to the course content.

III. SPECIAL NOTE: The Florida Technology Student Association (FL-TSA) is the appropriate vocational student organization for providing leadership training experiences and for reinforcing specific technology skills. When provided, these activities are considered an integral part of this instructional program.

The Intermediate and Advance courses in this program may articulate into postsecondary Tech-Prep 2 + 2 programs when taken in sequence. Tech-Prep 2 + 2 programs require articulation agreements between secondary and postsecondary educational agencies.

A proposed change to section 232.2467 F.S., Florida Gold Seal Vocational Endorsement would permit a student who "completed three credits in a sequential program of studies defined in an articulation agreement with a postsecondary institution(s) and leading to completion of a job preparatory program as defined by section 228.041 F.S." to be included. This would permit Technology Education students to participate in the Florida Gold Seal Vocational Endorsement.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate the ability to work safely with a variety of technologies.
02. Demonstrate interpersonal skills as they relate to the workplace.
03. Identify and apply methods of information acquisition and utilization.
04. Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.
05. Demonstrate and apply design/problem-solving processes.
06. Express an understanding of technological systems and their complex interrelationships.
07. Demonstrate the ability to properly identify, organize, plan, and allocate reources.
08. Discuss individual interests and aptitudes as they relate to a career.
09. Demonstrate employability skills.
10. Demonstrate an understanding of entrepreneurship.
11. Make an informed and meaningful career choice.
12. Demonstrate basic technical knowledge and skills about construction technology.
13. Apply advanced technical knowledge and skills about construction technology.
14. Demonstrate technical knowledge and skills about selecting and preparing a construction site.
15. Demonstrate technical knowledge and skills about designing and engineering constructed works.
16. Demonstrate technical knowledge and skills about contracting, estimating, bidding, and scheduling.
17. Demonstrate technical knowledge and skills about constructing substructures.
18. Demonstrate technical knowledge and skills about constructing superstructures.
19. Demonstrate technical knowledge and skills about installing utilities.
20. Demonstrate technical knowledge and skills about enclosing superstructures.
21. Demonstrate technical knowledge and skills about interior and exterior finishing of a constructed structure.
22. Perform advanced study and technical skills related to construction technology.
23. Operate a computer utilizing a program related to construction technology.
24. Demonstrate technical knowledge and skills about regional planning and the construction of civil or community structures.
25. Conduct structural tests on constructed structures and construction materials.
26. Conduct a research and experimentation project on a construction technology process or material.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education SECONDARY NUMBER: 8600700

PROGRAM TITLE: Principles of Construction Technology

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

- 01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
- 01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
- 01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
- 01.04 Follow laboratory safety rules and procedures.
- 01.05 Demonstrate good housekeeping at work station within total laboratory.
- 01.06 Identify color-coding safety standards.
- 01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
- 01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

- 02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
- 02.02 Participate as a member of a team.
- 02.03 Teach others new skills.
- 02.04 Identify skills needed to serve clients/customers.
- 02.05 Demonstrate leadership skills.
- 02.06 Describe strategies necessary for negotiating agreements.
- 02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
- 02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
- 02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
- 02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

- 03.01 Define terms related to computers.
- 03.02 Identify and describe methods of information acquisition and evalution.
- 03.03 Discuss advantages and disadvantages in the application of technologies.
- 03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
- 03.05 Comprehend and communicate information relevant to emerging technologies.
- 03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
 - integers, fractions, and decimals;
 - ratios, proportions, and percentages;
 - roots and powers;
 - algebra;
 - geometry.
04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry. (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "Brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--
The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--
The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--
The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--
The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--
The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.

11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

12.0 DEMONSTRATE BASIC TECHNICAL KNOWLEDGE AND SKILLS ABOUT CONSTRUCTION TECHNOLOGY--
The student will be able to:

12.01 Demonstrate basic technical knowledge and skills about student performance standards 14.01 through 21.04.
12.02 Demonstrate basic technical knowledge and skills in the construction of a structure.

13.0 APPLY ADVANCED TECHNICAL KNOWLEDGE AND SKILLS ABOUT CONSTRUCTION TECHNOLOGY--
The student will be able to:

13.01 Apply advanced technical knowledge and skills about student performance standards 14.01 through 21.04.
13.02 Apply advanced technical knowledge and skills in the construction of a structure.

14.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT SELECTING AND PREPARING A CONSTRUCTION SITE--
The student will be able to:

14.01 Explain the steps and processes for identifying, negotiating, selecting, and acquiring sites for construction.
14.02 Explain and perform elementary technical skills for surveying or mapping a construction site.
14.03 Describe the tools, equipment, and technical skills required for excavating a construction site.
14.04 Explain the load bearing importance of the earth and the reason for soil testing at a construction site.

15.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT DESIGNING AND ENGINEERING CONSTRUCTED WORKS--
The student will be able to:

15.01 Read and interpret architectural drawings, blueprints, symbols, and construction plans.
15.02 Describe building codes, permits, and inspection requirements.
15.03 Sketch or draw a plan for a construction project.

16.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT CONTRACTING, ESTIMATING, BIDDING, AND SCHEDULING--
The student will be able to:

16.01 Estimate construction costs using various methods including a computer.
16.02 Read and prepare bid invitations for contractors to build a construction project.
16.03 Establish criteria for awarding a construction contract.
16.04 Describe the content of a construction contract and performance bond.

17.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT CONSTRUCTING SUBSTRUCTURES--
The student will be able to:

17.01 Describe the types, parts, and purposes of foundations.
17.02 Describe the tools, materials, and processes for setting foundations.
17.03 Mix, place, and finish concrete for a floor, wall, or footing.
17.04 Perform the masonry technical skills of laying brick or block.

18.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT CONSTRUCTING SUPERSTRUCTURES--
The student will be able to:

18.01 Describe mass, solid wall, frame, and air-supported superstructures.
18.02 Describe the materials used in the construction of superstructures.
18.03 Use technical carpentry skills, tools, and materials in constructing a wood frame superstructure.
18.04 Use technical construction skills in building a steel or concrete frame superstructure.
18.05 Describe factory manufacturing of superstructures and modules.

19.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT INSTALLING UTILITIES
The student will be able to:

19.01 Describe public utility systems for supplying water, electricity, natural gas, and sewerage.
19.02 Describe the functions and operation of heating, cooling, and ventilating systems.
19.03 Demonstrate a technical knowledge of plumbing and electrical systems in homes or buildings.
19.04 Use the technical tools and skills to install plumbing and electrical systems utilities.
19.05 Diagnose and troubleshoot problems with utility systems.

20.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT ENCLOSING SUPERSTRUCTURES--
The student will be able to:

20.01 Describe the different types of materials and methods for constructing interior and exterior walls.
20.02 Describe the different types of materials and methods for laying floors and for building roofs.
20.03 Describe the different types of methods for constructing or installing windows and doors.
20.04 Describe the purposes, materials, and methods for insulating enclosed superstructures.
20.05 Perform the technical skills of enclosing a superstructure.

21.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT INTERIOR AND EXTERIOR FINISHING OF A CONSTRUCTED STRUCTURE--
The student will be able to:
21.01 Describe the different types of materials and methods for trimming, painting, and decorating a constructed structure.
21.02 Describe the types of accessories and fixtures that are installed to finish completed construction.
21.03 Explain the materials and methods used for the finishing processes of paving and landscaping.
21.04 Participate in processes of finishing a construction project and site.

22.0 PERFORM ADVANCED STUDY AND TECHNICAL SKILLS RELATED TO CONSTRUCTION TECHNOLOGY--
The student will be able to:

22.01 Select an individual or group project in cooperation with the teacher.
22.02 Develop a written plan of work to carry out the project.
22.03 Show evidence of technical study in support of the project.
22.04 Perform skills related to the project.
22.05 Complete the project as planned.

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23.0 OPERATE A COMPUTER UTILIZING A PROGRAM RELATED TO CONSTRUCTION TECHNOLOGY--
The student will be able to:

23.01 Collect or produce data on construction technology through the operation of a computer.

24.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT REGIONAL PLANNING AND THE CONSTRUCTION OF CIVIL OR COMMUNITY STRUCTURES--
The student will be able to:

24.01 Discuss community and regional planning needs and processes for the construction of roads, parks, dams, airports, seaports, warehouses, shopping centers, factories, and skyscrapers.
24.02 Develop a scale model of one of the above structures and give a report on the need.

25.0 CONDUCT STRUCTURAL TESTS ON CONSTRUCTED STRUCTURES AND CONSTRUCTION MATERIALS--
The student will be able to:

25.01 Perform scientific and technical tests on the strength, life, and uses of structures.
25.02 Perform scientific and technical tests on a variety of construction materials.

26.0 CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT ON A CONSTRUCTION MATERIAL OR PROCESS--
The student will be able to:

26.01 Identify a problem.
26.02 State a need to research the problem.
26.03 Form a hypothesis about the problem.
26.04 Plan the procedures for researching the problem.
26.05 Conduct the research following the planned procedures.
26.06 Present the research findings in a seminar.
26.07 State conclusions based on the research findings.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education COURSE CREDIT: 1

PROGRAM TITLE: Principles of Construction Technology PROGRAM NUMBER: 8600700

COURSE TITLE: Basic Principles of Construction Technology COURSE NUMBER: 8600710

COURSE DESCRIPTION:

This course provides students with an introduction to the knowledge, human relations, and technical skills of construction technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.

03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES-- The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
  -integers, fractions, and decimals;
  -ratios, proportions, and percentages;
  -roots and powers;
  -algebra;
  -geometry.
04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry. (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES-- The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.

05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "Brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--
The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--
The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--
The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--
The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.

10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--
The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

12.0 DEMONSTRATE BASIC TECHNICAL KNOWLEDGE AND SKILLS ABOUT CONSTRUCTION TECHNOLOGY--
The student will be able to:

12.01 Demonstrate basic technical knowledge and skills about student performance standards 14.01 through 21.04.
12.02 Demonstrate basic technical knowledge and skills in the construction of a structure.

14.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT SELECTING AND PREPARING A CONSTRUCTION SITE--
The student will be able to:

14.01 Explain the steps and processes for identifying, negotiating, selecting, and acquiring sites for construction.

14.02 Explain and perform the elementary technical skills for surveying or mapping a construction site.
14.03 Describe the tools, equipment, and technical skills required for excavating a construction site.
14.04 Explain the load bearing importance of the earth and the reason for soils testing at a construction site.

15.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT DESIGNING AND ENGINEERING CONSTRUCTED WORKS--
The student will be able to:

15.01 Read and interpret architectural drawings, blueprints, symbols, and construction plans.
15.02 Describe building codes, permits, and inspection requirements.
15.03 Sketch or draw a plan for a construction project.

16.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT CONTRACTING, ESTIMATING, BIDDING, AND SCHEDULING--
The student will be able to:

16.01 Estimate construction costs using various methods including a computer.
16.02 Read and prepare bid invitations for contractors to build a construction project.
16.03 Establish criteria for awarding a construction contract.
16.04 Describe the content of a construction contract and performance bond.

17.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT CONSTRUCTING SUBSTRUCTURES--
The student will be able to:

17.01 Describe the types, parts, and purposes of foundations.
17.02 Describe the tools, materials, and processes for setting foundations.
17.03 Mix, place, and finish concrete for a floor, wall, or footing.
17.04 Perform the masonry technical skills of laying brick or block.

18.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT CONSTRUCTING SUPERSTRUCTURES--
The student will be able to:

18.01 Describe mass, solid wall, frame, and air-supported superstructures.
18.02 Describe the materials used in the construction of superstructures.
18.03 Use technical carpentry skills, tools, and materials in constructing a wood frame superstructure.
18.04 Use technical construction skills in building a steel or concrete frame superstructure.
18.05 Describe factory manufacturing of superstructures and modules.

19.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT INSTALLING UTILITIES
The student will be able to:

19.01 Describe public utility systems for supplying water, electricity, natural gas, and sewerage.
19.02 Describe the functions and operation of heating, cooling, and ventilating systems.
19.03 Demonstrate a technical knowledge of plumbing and electrical systems in homes or buildings.
19.04 Use the technical tools and skills to install plumbing and electrical systems utilities.
19.05 Diagnose and troubleshoot problems with utility systems.

20.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT ENCLOSING SUPERSTRUCTURES--
The student will be able to:

20.01 Describe the different types of materials and methods for constructing interior and exterior walls.
20.02 Describe the different types of materials and methods for laying floors and for building roofs.
20.03 Describe the different types of methods for constructing or installing windows and doors.
20.04 Describe the purposes, materials, and methods for insulating enclosed superstructures.
20.05 Perform the technical skills of enclosing a superstructure.

21.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT INTERIOR AND EXTERIOR FINISHING OF A CONSTRUCTED STRUCTURE--
The student will be able to:

21.01 Describe the different types of materials and methods for trimming, painting, and decorating a constructed structure.
21.02 Describe the types of accessories and fixtures that are installed to finish completed construction.
21.03 Explain the materials and methods used for the finishing processes of paving and landscaping.
21.04 Participate in processes of finishing a construction project and site.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1992

PROGRAM AREA: Technology Education COURSE CREDIT: 1

PROGRAM TITLE: Principles of Construction Technology PROGRAM NUMBER: 8600700

COURSE TITLE: Intermediate Principles of Construction Technology COURSE NUMBER: 8600720

COURSE DESCRIPTION:

This course provides students with an expanded study and application of the knowledge, human relations, and technical skills of construction technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.

03.05 Comprehend and communicate information relevant to emerging technologies.

03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--
The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.

04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.

04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.

04.04 Distinguish fact from opinion.

04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.

04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.

04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.

04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.

04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.

04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.

04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.

04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.

04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.

04.14 Use the mathematics of:
 -integers, fractions, and decimals;
 -ratios, proportions, and percentages;
 -roots and powers;
 -algebra;
 -geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.

04.16 Use elementary concepts of probability and statistics.

04.17 Draw, read, and analyze graphs, charts, and tables.

04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.

04.19 Organize and communicate the results obtained by observation and experimentation.

04.20 Apply the basic principles of biology, physics, and chemistry. (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).

04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.

05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "Brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--
The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--
The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--
The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--
The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.

10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--

The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

13.0 APPLY ADVANCED TECHNICAL KNOWLEDGE AND SKILLS ABOUT CONSTRUCTION TECHNOLOGY--

The student will be able to:

13.01 Apply advanced technical knowledge and skills about student performance standards 14.01 through 21.04.
13.02 Apply advanced technical knowledge and skills in the construction of a structure.

14.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT SELECTING AND PREPARING A CONSTRUCTION SITE--

The student will be able to:

14.01 Explain the steps and processes for identifying, negotiating, selecting, and acquiring sites for construction.

14.02 Explain and perform the elementary technical skills for surveying or mapping a construction site.
14.03 Describe the tools, equipment, and technical skills required for excavating a construction site.
14.04 Explain the load bearing importance of the earth and the reason for soils testing at a construction site.

15.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT DESIGNING AND ENGINEERING CONSTRUCTED WORKS--

The student will be able to:

15.01 Read and interpret architectural drawings, blueprints, symbols, and construction plans.
15.02 Describe building codes, permits, and inspection requirements.
15.03 Sketch or draw a plan for a construction project.

16.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT CONTRACTING, ESTIMATING, BIDDING, AND SCHEDULING--

The student will be able to:

16.01 Estimate construction costs using various methods including a computer.
16.02 Read and prepare bid invitations for contractors to build a construction project.
16.03 Establish criteria for awarding a construction contract.
16.04 Describe the content of a construction contract and performance bond.

17.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT CONSTRUCTING SUBSTRUCTURES--

The student will be able to:

17.01 Describe the types, parts, and purposes of foundations.
17.02 Describe the tools, materials, and processes for setting foundations.
17.03 Mix, place, and finish concrete for a floor, wall, or footing.
17.04 Perform the masonry technical skills of laying brick or block.

18.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT CONSTRUCTING SUPERSTRUCTURES--

The student will be able to:

18.01 Describe mass, solid wall, frame, and air-supported superstructures.
18.02 Describe the materials used in the construction of superstructures.
18.03 Use technical carpentry skills, tools, and materials in constructing a wood frame superstructure.
18.04 Use technical construction skills in building a steel or concrete frame superstructure.
18.05 Describe factory manufacturing of superstructures and modules.

19.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT INSTALLING UTILITIES

The student will be able to:

19.01 Describe public utility systems for supplying water, electricity, natural gas, and sewerage.
19.02 Describe the functions and operation of heating, cooling, and ventilating systems.
19.03 Demonstrate a technical knowledge of plumbing and electrical systems in homes or buildings.
19.04 Use the technical tools and skills to install plumbing and electrical systems utilities.
19.05 Diagnose and troubleshoot problems with utility systems.

20.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT ENCLOSING SUPERSTRUCTURES--

The student will be able to:

20.01 Describe the different types of materials and methods for constructing interior and exterior walls.
20.02 Describe the different types of materials and methods for laying floors and for building roofs.
20.03 Describe the different types of methods for constructing or installing windows and doors.
20.04 Describe the purposes, materials, and methods for insulating enclosed superstructures.
20.05 Perform the technical skills of enclosing a superstructure.

21.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT INTERIOR AND EXTERIOR FINISHING OF A CONSTRUCTED STRUCTURE--

The student will be able to:

21.01 Describe the different types of materials and methods for trimming, painting, and decorating a constructed structure.
21.02 Describe the types of accessories and fixtures that are installed to finish completed construction.
21.03 Explain the materials and methods used for the finishing processes of paving and landscaping.
21.04 Participate in processes of finishing a construction project and site.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1992

PROGRAM AREA: Technology Education COURSE CREDIT: 1

PROGRAM TITLE: Principles of Construction Technology PROGRAM NUMBER: 8600700

COURSE TITLE: Advanced Principles of Construction Technology COURSE NUMBER: 8600730

COURSE DESCRIPTION:
This course provides students with an advanced study and application of the knowledge, human relations, and technical skills of construction technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.

03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--
The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
 -integers, fractions, and decimals;
 -ratios, proportions, and percentages;
 -roots and powers;
 -algebra;
 -geometry.
04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry. (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
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The student will be able to:

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The student will be able to:

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The student will be able to:

08.01 Describe individual strengths and weaknesses.
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10.01 Define entrepreneurship.
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11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--
The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

22.0 PERFORM ADVANCED STUDY AND TECHNICAL SKILLS RELATED TO CONSTRUCTION TECHNOLOGY--
The student will be able to:

22.01 Select an individual or group project in cooperation with the teacher.
22.02 Develop a written plan of work to carry out the project.
22.03 Show evidence of technical study in support of the project.
22.04 Perform skills related to the project.
22.05 Complete the project as planned.

23.0 OPERATE A COMPUTER UTILIZING A PROGRAM RELATED TO CONSTRUCTION TECHNOLOGY--
The student will be able to:

23.01 Collect or produce data on construction technology through the operation of a computer.

24.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT REGIONAL PLANNING AND THE CONSTRUCTION OF CIVIL OR COMMUNITY STRUCTURES--
The student will be able to:

24.01 Discuss community and regional planning needs and processes for the construction of roads, parks, dams, airports, seaports, warehouses, shopping centers, factories, and skyscrapers.
24.02 Develop a scale model of one of the above structures and give a report on the need

25.0 CONDUCT STRUCTURAL TESTS ON CONSTRUCTED STRUCTURES AND CONSTRUCTION MATERIALS--
The student will be able to:

25.01 Perform scientific and technical tests on the strength, life, and uses of structures.
25.02 Perform scientific and technical tests on a variety of construction materials.

26.0 CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT ON A CONSTRUCTION MATERIAL OR PROCESS--
The student will be able to:

26.01 Identify a problem.
26.02 State a need to research the problem.
26.03 Form a hypothesis about the problem.
26.04 Plan the procedures for researching the problem.
26.05 Conduct the research following the planned procedures.
26.06 Present the research findings in a seminar.
26.07 State conclusions based on the research findings.

CURRICULUM FRAMEWORK PROGRAM AREA: Technology Education

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Drafting and Design Technology

CODE NUMBER: Secondary 8600800 Postsecondary ______

Florida CIP 0821.010300

SECONDARY SCHOOL CREDITS 3 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 X 9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational X Other 30, 31

CERTIFICATION COVERAGE:
INDUS ARTS @ 4 @ 6
GEN SHOP @ 4
I ART-TEC 1 @2
GRAPHIC ARTS @ 4
DRAFTING @ 7 G

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to provide students with a foundation of knowledge and technically oriented experiences in the study of drafting and design technology including Computer-Aided Drafting (C.A.D.).

The content includes, but is not limited to, a study of the purposes,instruments, processes, and technical skills of drafting technology. Special emphasis should be placed on the development of computer skills. Including skills directly related to the installation, operation, and drawing retrieval of modern Computer-Aided Drafting (C.A.D.) systems. The content and activities will also include the study of entrepreneurship, safety, and leadership skills.

Listed below are the courses that make up this program. Proposed design code 242 as shown in DVACE joint Memorandum 92-37 of May 27, 1992, is appropriate for this program.

8600810	Drafting and Design Technology I
8600820	Drafting and Design Technology II
8600830	Drafting and Design Technology III

II. LABORATORY ACTIVITIES: Instruction and learning activities are provided in a laboratory setting using hands-on experiences with the tools and materials appropriate to the course content.

III. SPECIAL NOTE: The Florida Technology Student Association (FL-TSA) is the appropriate vocational student organization for providing leadership training experiences and for reinforcing specific technology skills. When provided,the activities are considered an integral part of this instructional program.

The Level II and Level III courses in this program may articulate into postsecondary Tech-Prep 2 + 2 programs when taken in sequence. Tech-Prep 2 + 2 programs require articulation agreements between secondary and postsecondary educational agencies.

A proposed change to section 232.2467 F.S., Florida Gold Seal Vocational Endorsement would permit a student who "completed three credits in a sequential program of studies defined in an articulation agreement with a postsecondary institution(s) and leading to completion of a job preparatory program as defined by section 228.041 F.S." to be included. This would permit Technology Education students to participate in the Florida Gold Seal Vocational Endorsement.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate the ability to work safely with a variety of technologies.
02. Demonstrate interpersonal skills as they relate to the workplace.
03. Identify and apply methods of information acquisition and utilization.
04. Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.
05. Demonstrate and apply design/problem-solving processes.
06. Express an understanding of technological systems and their complex interrelationships.
07. Demonstrate the ability to properly identify, organize, plan, and allocate reources.
08. Discuss individual interests and aptitudes as they relate to a career.
09. Demonstrate employability skills.
10. Demonstrate an understanding of entrepreneurship.
11. Make an informed and meaningful career choice.
12. Demonstrate technical knowledge and skills about the use and care of drafting instruments, equipment, and materials.
13. Demonstrate technical skills and applications common to all types of drafting.
14. Demonstrate technical knowledge and skills for making orthographic drawings.
15. Demonstrate technical knowledge and skills for making pictorial drawings.
16. Demonstrate technical knowledge and skills for making auxiliary view drawings.
17. Demonstrate technical knowledge and skills for making sectional view drawings.
18. Demonstrate technical knowledge and skills for making engineering drawings.
19. Demonstrate technical knowledge and skills for making architectural drawings.
20. Demonstrate technical knowledge and skills for making technical illustrations.
21. Demonstrate basic technical knowledge and skills for making a computer-assisted drawing (CAD).
22. Perform advanced study and technical skills related to drafting technology.
23. Operate a computer utilizing a program related to drafting technology.
24. Demonstrate technical knowledge and skills about modeling as a drafting aid.
25. Demonstrate technical knowledge and skills about the fundamentals of design and design procedures.
26. Conduct a research and experimentation project on drafting technology.

STUDENT PERFORMANCE STANDARDS　　EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education　　SECONDARY NUMBER: 8600800

PROGRAM TITLE: Drafting and Design Technology

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The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
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05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
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The student will be able to:

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11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--
The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.

11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

12.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT THE USE AND CARE OF DRAFTING INSTRUMENTS, EQUIPMENT, AND MATERIALS--
The student will be able to:

12.01 Identify and demonstrate technical knowledge and skills about the use and care of drafting instruments.
12.02 Identify and demonstrate technical knowledge and skills about the use and care of drafting equipment.
12.03 Demonstrate technical knowledge and skills about the properties, specifications, and use of drafting materials and supplies.

13.0 DEMONSTRATE TECHNICAL SKILLS AND APPLICATIONS COMMON TO ALL TYPES OF DRAFTING--
The student will be able to:

13.01 Use proper drafting symbols and alphabet of lines in accordance with technical standards and practices.
13.02 Apply proper lettering techniques.
13.03 Apply geometric construction techniques.
13.04 Interpret information from drawings, prints, and sketches.
13.05 Make freehand sketches.
13.06 Produce and reproduce drawings using modern technical methods for drafting reproduction.

14.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING ORTHOGRAPHIC DRAWINGS--
The student will be able to:

14.01 Explain the theory of orthographic projection.
14.02 Identify the six principal views of an object.
14.03 Produce a three-view orthographic drawing.
14.04 Produce a C.A.D. generated three-view orthographic drawing.

15.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING PICTORIAL DRAWINGS-
The student will be able to:

15.01 Explain methods of pictorial drawing.
15.02 Produce an isometric drawing.
15.03 Produce an C.A.D. generated isometric drawing.
15.04 Produce an oblique drawing.
15.05 Produce an C.A.D. generated oblique drawing.
15.06 Produce a perspective drawing.

16.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING AUXILIARY VIEW DRAWINGS--
The student will be able to:

16.01 Describe the terms normal view, inclined surface, and skewed surface.
16.02 Produce an auxiliary view drawing.
16.03 Produce an C.A.D. generated auxiliary view drawing.

17.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING SECTIONAL VIEW DRAWINGS--
The student will be able to:

17.01 Define sectional view.
17.02 Describe types of sectional views.
17.03 Illustrate the types of breaks and symbols used in drawing sectional views.

17.04 Produce a sectional view drawing.
17.05 Produce a C.A.D. generated auxiliary view drawing.

18.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING ENGINEERING DRAWINGS--
The student will be able to:

18.01 Produce detailed machine drawings with tolerances, cams, gears, hidden surfaces and other mechanical details.
18.02 Produce detailed assembly drawings with screws, keys, rivets, welded joints, and other assembly details.
18.03 Produce detailed electronic schematics with circuits, power sources, controls, and other electronic components.
18.04 Produce an C.A.D. generated engineering drawing.

19.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING ARCHITECTURAL DRAWINGS--
The student will be able to:

19.01 Produce dimensioned floor plan drawings showing walls, windows, doors, cabinets, stairs, appliances, fixtures, and other details.
19.02 Produce a C.A.D. generated dimensioned floor plan.
19.03 Produce dimensioned elevation drawings showing grade lines, floors, ceilings, windows, doors, and other details.
19.04 Produce a C.A.D. generated elevation drawing.
19.05 Produce a dimensioned architectural electrical plan.
19.06 Produce a C.A.D. generated dimensioned electrical plan.
19.07 Produce a dimensioned architectural plumbing plan.
19.08 Produce a C.A.D. generated dimensioned plumbing plan.
19.09 Produce a dimensioned architectural climate control plan.
19.10 Produce a C.A.D. generated dimensioned climate control plan.
19.11 Produce a dimensioned landscape plan for a construction site.
19.12 Produce a C.A.D. generated dimensioned landscape plan for a contruction site.

20.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING TECHNICAL ILLUSTRATIONS--
The student will be able to:

20.01 Produce a colored or shaded pictorial rendering for presentation.
20.02 Produce a labeled graph or chart for display.
20.03 Produce a dimensioned map or topographic drawing of land, sea, or air boundaries.

21.0 DEMONSTRATE BASIC TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING A COMPUTER ASSISTED DRAWING (CAD)--
The student will be able to:

21.01 Apply basic knowledge and skills of drafting on CAD systems by completing assigned drawings in either the engineering, architectural, or technical illustrations classification.
21.02 Plot a drawing generated by CAD.

22.0 PERFORM ADVANCED STUDY AND TECHNICAL SKILLS RELATED TO DRAFTING TECHNOLOGY--
The student will be able to:

22.01 Select an individual or group project in cooperation with the teacher.
22.02 Develop a written plan of work to carry out the project.
22.03 Show evidence of technical study in support of the project.
22.04 Perform skills related to the project.
22.05 Complete the project as planned.

23.0 OPERATE A COMPUTER UTILIZING A PROGRAM RELATED TO DRAFTING TECHNOLOGY
The student will be able to:

23.01 Collect or produce data on drafting technology through the operation of a computer.

24.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT MODELING AS A DRAFTING AID--
The student will be able to:

24.01 Demonstrate the technical skills of producing a clay, wax, wood, plastic, or cardboard scale model.
24.02 Build a scale model to represent an architectural design, prototype design, plot-plan, route layout, equipment design, or equipment arrangement.
24.03 Demonstrate the use of photography in producing or presenting model photo drawings.

25.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT THE FUNDAMENTALS OF DESIGN AND DESIGN PROCEDURES--
The student will be able to:

25.01 Describe the basic principles and functions of good design.
25.02 Outline steps and procedures followed in the design of a product.
25.03 Demonstrate ways in which designs are presented to manufacturers and to customers.
25.04 Develop a variety of designs using conventional methods and a CAD system.

26.0 CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT ON DRAFTING TECHNOLOGY
The student will be able to:

26.01 Identify a problem.
26.02 State a need to research the problem.
26.03 Form a hypothesis about the problem.
26.04 Plan the procedures for researching the problem.
26.05 Conduct the research following the planned procedures.
26.06 Present the research findings in a seminar.
26.07 State conclusions based on the research findings.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education COURSE CREDIT: 1

PROGRAM TITLE: Drafting and Design Technology PROGRAM NUMBER: 8600800

COURSE TITLE: Drafting and Design Technology I COURSE NUMBER: 8600810

COURSE DESCRIPTION:

This course provides students with an introduction to the knowledge, human relations, and technical skills of drafting technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.

03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--
The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.

04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.

04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
 -integers, fractions, and decimals;
 -ratios, proportions, and percentages;
 -roots and powers;
 -algebra;
 -geometry.
04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry. (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.

05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "Brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--
The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--
The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--
The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--
The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.

10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--
The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

12.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT THE USE AND CARE OF DRAFTING INSTRUMENTS, EQUIPMENT, AND MATERIALS--
The student will be able to:

12.01 Identify and demonstrate technical knowledge and skills about the use and care of drafting instruments.
12.02 Identify and demonstrate technical knowledge and skills about the use and care of drafting equipment.
12.03 Demonstrate technical knowledge and skills about the properties, specifications, and use of drafting materials and supplies.

13.0 DEMONSTRATE TECHNICAL SKILLS AND APPLICATIONS COMMON TO ALL TYPES OF DRAFTING--
The student will be able to:

13.01 Use proper drafting symbols and alphabet of lines in accordance with technical standards and practices.
13.02 Apply proper lettering techniques.
13.03 Apply geometric construction techniques.
13.04 Interpret information from drawings, prints, and sketches.
13.05 Make freehand sketches.
13.06 Produce and reproduce drawings using modern technical methods for drafting reproduction.

14.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING ORTHOGRAPHIC DRAWINGS--
The student will be able to:

14.01 Explain the theory of orthographic projection.
14.02 Identify the six principal views of an object.
14.03 Produce a three-view orthographic drawing.
14.04 Produce a C.A.D. generated three-view orthograhic drawing.

15.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING PICTORIAL DRAWINGS-
The student will be able to:

15.01 Explain methods of pictorial drawing.
15.02 Produce an isometric drawing.
15.03 Produce a C.A.D. generated isometric drawing.
15.04 Produce a oblique drawing.
15.05 Produce a C.A.D. generated oblique drawing.
15.06 Produce a perspective drawing.

16.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING AUXILIARY VIEW DRAWINGS--
The student will be able to:

16.01 Describe the terms normal view, inclined surface, and skewed surface.
16.02 Produce an auxiliary view drawing.
16.03 Produce a C.A.D. auxiliary view drawing.

17.01 Define sectional view.
17.02 Describe types of sectional views.
17.03 Illustrates the types of breaks and symbols used in drawing sectional views.
17.04 Produce a sectional view drawing.
17.05 Produce a C.A.D. generated sectional view drawing.

18.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING ENGINEERING DRAWINGS--
The student will be able to:

18.01 Produce detailed machine drawings with tolerances, cams, gears, hidden surfaces and other mechanical details.
18.02 Produce detailed assembly drawings with screws, keys, rivets, welded joints, and other assembly details.
18.03 Produce detailed electronic schematics with circuits, power sources, controls, and other electronic components.

19.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING ARCHITECTURAL DRAWINGS--
The student will be able to:

19.01 Produce dimensional floor plan drawings showing walls, windows, doors, cabinets, stairs, appliances, fixtrures, and other details.
19.02 Produce dimensional elevation drawings showing grade lines, floors, ceilings, windows, doors, and other details.

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STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education COURSE CREDIT: 1

PROGRAM TITLE: Drafting and Design Technology PROGRAM NUMBER: 8600800

COURSE TITLE: Drafting and Design Technology II COURSE NUMBER: 8600820

COURSE DESCRIPTION:

This course provides students with an expanded study and application of the knowledge, human relations, and technical skills of drafting technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evaluation.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.

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03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--
The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.

04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.

04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
 -integers, fractions, and decimals;
 -ratios, proportions, and percentages;
 -roots and powers;
 -algebra;
 -geometry.
04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry. (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.

05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "Brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--
The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--
The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--
The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--
The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business

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11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--
The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

14.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING ORTHOGRAPHIC DRAWINGS--
The student will be able to:

14.01 Identify the six principal views of an object.
14.02 Produce a three-view orthographic drawing.
14.03 Produce a C.A.D. generated three-view orthograhic drawing.

15.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING PICTORIAL DRAWINGS--
The student will be able to:

15.01 Explain methods of pictorial drawings.
15.02 Produce an advanced isometric drawing.
15.03 Produce a C.A.D. generated advanced isometric drawing.
15.04 Produce and advanced oblique drawing.
15.05 Produce a C.A.D. generated advanced oblique drawing.

17.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING SECTIONAL VIEW DRAWINGS--
The student will be able to:

17.01 Define sectional view.
17.02 Produce an advanced sectional view drawing.
17.03 Produce a C.A.D. generated advance sectional view.

18.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING ENGINEERING DRAWINGS--
The student will be able to:

18.01 Produce an advanced detailed machine drawings with tolerances, cams, gears, hidden surfaces and other mechanical details.
18.02 Produce a C.A.D. generated advanced detailed machine drawing.

19.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING ARCHITECTURAL DRAWINGS--
The student will be able to:

19.01 Produce dimensioned floor plan drawings showing walls, windows, doors, cabinets, stairs, appliances, fixtures, and other details.
19.02 Produce a C.A.D. generated dimensional floor plan.
19.03 Produce dimensional elevation drawings showing grade lines, floors, ceilings, windows, doors, and other details.
19.04 Produce a C.A.D. generated dimensional elevation drawing.
19.05 Produce a dimensional architectural electrical plan.
19.06 Produce a C.A.D. generated dimensional electrical plan.
19.07 Produce a dimensional architectural plumbing plan.
19.08 Produce a C.A.D. generated dimensional architectural plumbing plan.
19.09 Produce a dimensional architectural climate control plan.
19.10 Produce a C.A.D. generated dimensional climate control plan.
19.11 Produce a dimensional landscape plan for a construction site.
19.12 Produce a C.A.D. generated dimensional landscape plan.

20.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING TECHNICAL ILLUSTRATIONS--
The student will be able to:

20.01 Produce a colored or shaded pictorial rendering for presentation.
20.02 Produce a labeled graph or chart for display.
20.03 Produce a dimensioned map or topographic drawing of land, sea, or air boundaries.

21.0 DEMONSTRATE BASIC TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING A COMPUTER ASSISTED DRAWING (CAD)--
The student will be able to:

21.01 Apply basic knowledge and skills of drafting on CAD systems by completing assigned drawings in either the engineering, architectural, or technical illustrations classification.
21.02 Plot a drawing generated by CAD.

25.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT THE FUNDAMENTALS OF DESIGN AND DESIGN PROCEDURES--
The student will be able to:

25.01 Describe the basic principles and functions of good design.
25.02 Outline steps and procedures followed in the design of a product.

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STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education COURSE CREDIT: 1

PROGRAM TITLE: Drafting and Design Technology PROGRAM NUMBER: 8600800

COURSE TITLE: Drafting and Design Technology III COURSE NUMBER: 8600830

COURSE DESCRIPTION:

This course provides students with an advanced study and application of the knowledge, human relations, and technical skills of drafting technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.

03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--
The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.

04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.

04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
 -integers, fractions, and decimals;
 -ratios, proportions, and percentages;
 -roots and powers;
 -algebra;
 -geometry.
04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry. (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.

05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "Brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--
The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--
The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--
The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--
The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.

10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--
The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

22.0 PERFORM ADVANCED STUDY AND TECHNICAL SKILLS RELATED TO DRAFTING TECHNOLOGY--
The student will be able to:

22.01 Select an individual or group project in cooperation with the teacher.
22.02 Develop a written plan of work to carry out the project.
22.03 Show evidence of technical study in support of the project.
22.04 Perform skills related to the project.
22.05 Complete the project as planned.

23.0 OPERATE A COMPUTER UTILIZING A PROGRAM RELATED TO DRAFTING TECHNOLOGY
The student will be able to:

23.01 Collect or produce data on drafting technology through the operation of a computer.

24.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT MODELING AS A DRAFTING AID--
The student will be able to:

24.01 Demonstrate the technical skills of producing a clay, wax, wood, plastic, or cardboard scale model.
24.02 Build a scale model to represent an architectural design, prototype design, plot-plan, route layout, equipment design, or equipment arrangement.
24.03 Demonstrate the use of photography in producing or presenting model photo drawings.

25.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT THE FUNDAMENTALS OF DESIGN AND DESIGN PROCEDURES--
The student will be able to:

26.01 Describe the basic principles and functions of good design.
26.02 Outline steps and procedures followed in the design of a product.
26.03 Demonstrate ways in which designs are presented to manufacturers and to customers.
26.04 Develop a variety of designs using conventional methods and a CAD system.

26.0 CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT ON DRAFTING TECHNOLOGY--
The student will be able to:

26.01 Identify a problem.
26.02 State a need to research the problem.
26.03 Form a hypothesis about the problem.
26.04 Plan the procedures of researching the problem.
26.05 Conduct the research following the planned procedures.
26.06 Present the research findings in a seminar.
26.07 State conclusions based on the research findings.

CURRICULUM FRAMEWORK PROGRAM AREA: Technology Education

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Electronics Technology

CODE NUMBER: Secondary 8600900 Postsecondary ______

Florida CIP 0821.010400

SECONDARY SCHOOL CREDITS 3 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ______ 7-9 X 9-12 ______ Postsecondary Adult Vocational

______ Postsecondary Vocational X Other 30, 31

CERTIFICATION COVERAGE: INDUS ARTS @ 4 @ 6 ELECTRONICS @ 7 G TEC ELEC @ 7 G
GEN SHOP @ 4 ELECTRICAL @ 4, @ 7 G
I ART-TEC 1 @2

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to provide students with a foundation of knowledge and technically oriented experiences in the study of electronics technology.

The content includes, but is not limited to, the theory, use, and technical application of electronics technology. The content and activities will also include the study of entrepreneurship, safety, and leadership skills.

Listed below are the courses that make up this program. Proposed design code 241 as shown in DVACE joint Memorandum 92-37 of May 27, 1992, is appropriate for this program.

8600910	Electronics Technology I
8600920	Electronics Technology II
8600930	Electronics Technology III

II. LABORATORY ACTIVITIES: Instruction and learning activities are provided in a laboratory setting using hands-on experiences with the tools and materials appropriate to the course content.

III. SPECIAL NOTE: The Florida Technology Student Association (FL-TSA) is the appropriate vocational student organization for providing leadership training experiences and for reinforcing specific technology skills. When provided, these activities are considered an integral part of this instructional program.

The Level II and Level III courses in this program may articulate into postsecondary Tech-Prep 2 + 2 programs when taken in sequence. Tech-Prep 2 + 2 programs require articulation agreements between secondary and postsecondary educational agencies.

A proposed change to section 232.2467 F.S., Florida Gold Seal Vocational Endorsement would permit a student who "completed three credits in a sequential program of studies defined in an articulation agreement with a postsecondary institution(s) and leading to completion of a job preparatory program as defined by section 228.041 F.S." to be included. This would permit Technology Education students to participate in the Florida Gold Seal Vocational Endorsement.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate the ability to work safely with a variety of technologies.
02. Demonstrate interpersonal skills as they relate to the workplace.
03. Identify and apply methods of information acquisition and utilization.
04. Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.
05. Demonstrate and apply design/problem-solving processes.
06. Express an understanding of technological systems and their complex interrelationships.
07. Demonstrate the ability to properly identify, organize, plan, and allocate reources.
08. Discuss individual interests and aptitudes as they relate to a career.
09. Demonstrate employability skills.
10. Demonstrate an understanding of entrepreneurship.
11. Make an informed and meaningful career choice.
12. Describe the structure of matter related to electronics.
13. Describe, construct, conduct, and analyze experiments with basic DC and AC circuits and with circuits using magnetism.
14. Identify, measure, and describe the function of transformers and inductors in electronic circuits.
15. Use Ohm's law and Watt's law to analyze and experiment with resistive circuits.
16. Describe, construct, analyze, and experiment with capacitive circuits.
17. Demonstrate the use of electronic equipment.
18. Demonstrate proper electronic assembly methods.
19. Demonstrate an understanding of basic electrical circuits and electronic systems.
20. Describe the structure of matter related to electronics.
21. Describe, construct, conduct, and analyze experiments with basic DC and AC circuits and with circuits using magetism.
22. Identify, measure, and describe the function of transformers and inductors in electronic circuits.
23. Use Ohm's law and Watt's law to analyze and experiment with resistive circuits.
24. Describe, construct, analyze, and experiment with capacitive circuits
25. Describe and experiment with integrated circuits.
26. Demonstrate the use of electronic equipment.
27. Demonstrate an understanding of basic electrical circuits and electronic systems.
28. Describe, conduct, and experiment with circuits using semiconductors.
29. Perform advanced study and skills related to electronics technology.
30. Demonstrate an understanding of the principles and applications of microcomputer systems.
31. Describe, identify, and correct problems in electronic circuits.
32. Demonstrate technical knowledge and skills about electronic networks and systems.
33. Conduct a research and experimentation project on an electronic system or process.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education SECONDARY NUMBER: 8600900

PROGRAM TITLE: Electronics Technology

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.

04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.

04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
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04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
 -integers, fractions, and decimals;
 -ratios, proportions, and percentages;
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 -geometry.
04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry. (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "Brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--
The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--
The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--
The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--
The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--
The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.

11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

12.0 DESCRIBE THE STRUCTURE OF MATTER RELATED TO ELECTRONICS--
The student will be able to:

12.01 Describe the composition of elements, mixtures, and compounds according to the electron theory.
12.02 List the atomic subparticles.
12.03 Diagram and show the relationship between electrons, protons, and neutrons.
12.04 State the law of electrical charges.
12.05 Describe the classification and characteristics of materials as they apply to conductors, insulators, and semiconductors.
12.06 Demonstrate proficiency in the identification of electronics symbols.

13.0 DESCRIBE, CONSTRUCT, CONDUCT, AND ANALYZE EXPERIMENTS WITH BASIC DC AND AC CIRCUITS AND WITH CIRCUITS USING MAGNETISM--
The student will be able to:

13.01 Solve electronic math problems related to DC and AC circuits.
13.02 Define voltage, current, resistance, power, and energy.
13.03 Set up and test basic circuits.
13.04 Set up and operate multimeters in DC and AC circuits.
13.05 Set up and operate power supplies in DC circuits.
13.06 Describe magnetism, the law of magnetic poles, and the behavior of flux lines.
13.07 Demonstrate electromagnetism.
13.08 Construct simple circuits using a relay.

14.0 IDENTIFY, MEASURE, AND DESCRIBE THE FUNCTION OF TRANSFORMERS AND INDUCTORS IN ELECTRONIC CIRCUITS--
The student will be able to:

14.01 Explain the theory of operation and application of inductance in inductors and transformers.
14.02 Explain what an inductor is and what its purpose is.
14.03 Construct circuits using transformers and inductors.
14.04 Explain inductive reactance.

15.0 USE OHM'S LAW AND WATT'S LAW TO ANALYZE AND EXPERIMENT WITH RESISTIVE CIRCUITS--
The student will be able to:

15.01 Identify resistors by color code.
15.02 Identify and measure resistors.
15.03 Apply Ohm's law to circuits.
15.04 Explain how resistors are constructed.
15.05 Apply Watt's law to circuits.
15.06 Use a VOM to verify values.
15.07 Identify different types of resistors, and explain their use and ratings.

16.0 DESCRIBE, CONSTRUCT, ANALYZE AND EXPERIMENT WITH CAPACITIVE CIRCUITS--
The student will be able to:

16.01 Explain how a capacitor stores electrical energy.
16.02 Explain how a capacitor is constructed.
16.03 Explain capacitive reactance.

17.0 DEMONSTRATE THE USE OF ELECTRONIC EQUIPMENT--
The student will be able to:

17.01 Use a VOM to obtain accurate measurements.
17.02 Apply safety rules in the use of electronic instruments and demonstrate proper care and maintenance for the equipment during storage and use.
17.03 Use voltmeters, ammeters, and ohmmeters to obtain accurate measurements.
17.04 Set up and use an oscilloscope to observe waveforms and to determine the voltage of the signal presented.
17.05 Use signal generators to produce waveforms of selected frequencies and shapes.
17.06 Use testers to determine the condition of electronic components.

18.0 DEMONSTRATE PROPER ELECTRONIC ASSEMBLY METHODS--
The student will be able to:

18.01 Exhibit safe soldering techniques.
18.02 Identify proper soldering practices.
18.03 Demonstrate proper soldering applications.
18.04 Identify common electrical and electronics hand tools.
18.05 Demonstrate electronic component assembly.
18.06 Apply electrical tape to a spliced and soldered wire connection.
18.07 Solder and desolder components and wires.
18.08 Describe the two methods of making a printed circuit board.

19.0 DEMONSTRATE AN UNDERSTANDING OF BASIC ELECTRICAL CIRCUITS AND ELECTRONIC SYSTEMS--
The student will be able to:

19.01 Identify problems and demonstrate appropriate solutions when dealing with series, series-parallel, parallel, voltage dividers, and network circuits.
19.02 Define electronic systems.
19.03 Describe the importance of electronic systems in today's technology world.
19.04 Define electronic input, process and output of electronic systems.
19.05 Conduct electronic experiments using input, process and output systems.
19.06 Describe, design and conduct experiments with electronic systems.
19.07 Define and give an example of a super conductor.

20.0 DESCRIBE THE STRUCTURE OF MATTER RELATED TO ELECTRONICS--
The student will be able to:

20.01 Describe the composition of element, mixtures, and compounds according to the electron theory.
20.02 List the atomic subparticles.
20.03 Diagram and show the relationship between electrons, protons, and neutrons.
20.04 State the law of electrical charges.

20.05 Describe the classification and characteristics of materials as they apply to conductors, insulators, and semiconductors.
20.06 Demonstrate proficiency in the identification of electronics symbols.

21.0 DESCRIBE, CONSTRUCT, CONDUCT, AND ANALYZE EXPERIMENTS WITH BASIC DC AND AC CIRCUITS AND WITH CIRCUITS USING MAGNETISM--
The student will be able to:

21.01 Solve electronic math problems related to DC and AC circuits.
21.02 Define voltage, current, resistance, power, and energy.
21.03 Set up and test basic circuits.
21.04 Set up and operate multimeters in DC and AC circuits.
21.05 Set up and operate power supplies in DC circuits.

21.06 Describe magnetism, the law of magnetic poles, and the behavior of flux lines.
21.07 Demonstrate electromagnetism.
21.08 Construct simple circuits using a relay.

22.0 IDENTIFY, MEASURE, AND DESCRIBE THE FUNCTION OF TRANSFORMERS AND INDUCTORS IN ELECTRONIC CIRCUITS--
The student will be able to:

22.01 Explain the theory of operation and application of inductance in inductors and transformers.
22.02 Explain what an inductor is and what its purpose is.
22.03 Construct circuits using transformers and inductors.
22.04 Explain inductive reactance.

23.0 USE OHM'S LAW AND WATT'S LAW TO ANALYZE AND EXPERIMENT WITH RESISTIVE CIRCUITS--
The student will be able to:

23.01 Identify resistors by color code.
23.02 Identify and measure resistors.
23.03 Apply Ohm's law to circuits.
23.04 Explain how resistors are constructed.
23.05 Apply Watt's law to circuits.
23.06 Use a VOM to verify values.
23.07 Identify different types of resistors, and explain their use ratings.

24.0 DESCRIBE, CONSTRUCT, ANALYZE AND EXPERIMENT WITH CAPACITIVE CIRCUITS--
The student will be able to:

24.01 Explain how a capacitor stores electrical energy.
24.02 Explain how a capacitor is constructed.
24.03 Explain capacitive reactance.

25.0 DESCRIBE AND EXPERIMENT WITH INTEGRATED CIRCUITS--
The student will be able to:

25.01 Explain what integrated circuits (IC's) are and how they are manufactured.
25.02 Explain the advantages of integrated circuits as compared to discrete component circuits.
25.03 Construct electronic circuits which contain ICs.
25.04 Describe the basic types of integrated circuit design, along with their pin numbering systems and dimensions.

26.0 DEMONSTRATE THE USE OF ELECTRONIC EQUIPMENT--
The student will be able to:

26.01 Use a VOM to obtain accurate measurements.
26.02 Apply safety rules in the use of electronic instruments and demonstrate proper care and maintenance for the equipment during storage and use.
26.03 Use voltmeters, ammeters, and ohmmeters to obtain accurate measurements.
26.04 Set up and use an oscilloscope to observe waveforms and to determine the voltage of the signal presented.
26.05 Use signal generators to produce waveforms of selected frequencies and shapes.
26.06 Use testers to determine the condition of electronic components.

27.0 DEMONSTRATE AN UNDERSTANDING OF BASIC ELECTRICAL CIRCUITS AND ELECTRONIC SYSTEMS--
The student will be able to:

27.01 Identify problems and demonstrate appropriate solutions when dealing with series, series-parallel, parallel, voltage dividers, and network circuits.
27.02 Define electronic systems.
27.03 Describe the importance of electronic systems in today's technology world.
27.04 Define electronic input, process and output of electronic systems.
27.05 Conduct electronic experiments using input, process and output systems.
27.06 Describe, design and conduct experiments with electronic systems.
27.07 Define and give an example of a super conductor.

28.0 DESCRIBE, CONSTRUCT, AND EXPERIMENT WITH CIRCUITS USING SEMICONDUCTORS--
The student will be able to:

28.01 Describe the general theory and application of semiconductor devices.
28.02 Explain the difference between N-type and P-type material.
28.03 Explain the precautions necessary when working with solid state devices.
28.04 Demonstrate the proper procedures for the installation of solid state components using thermal release devices (heat sinks).
28.05 Construct and experiment with semiconductor devices.
28.06 Construct and test circuits which contain solid state components such as FET'S, SCR's, UJT's, tunnel diodes, zener diodes, zener diodes, light emitting diodes, etc.

29.0 PERFORM ADVANCED STUDY AND SKILLS RELATED TO ELECTRONICS--
The student will be able to:

29.01 Select an individual or group project in cooperation with the teacher.
29.02 Develop a written plan of work to carry out the project.
29.03 Show evidence of technical study in support of the project.
29.04 Perform skills related to the project.
29.05 Complete the project as planned.

30.0 DEMONSTRATE AN UNDERSTANDING OF THE PRINCIPLES AND APPLICATIONS OF MICROCOMPUTER SYSTEMS--
The student will be able to:

30.01 Define microcomputer systems.
30.02 Describe the importance of microcomputer systems in today's technology world.
30.03 Describe microcomputer applications in today's technology world.
30.04 Define microcomputer interfacing.
30.05 Conduct microcomputer systems experiments.
30.06 Conduct microcomputer systems interfacing, sensing and control applications.

31.0 DESCRIBE, IDENTIFY, AND CORRECT PROBLEMS IN ELECTRONIC CIRCUITS--
The student will be able to:

31.01 Identify problems and demonstrate solutions when dealing with power supplies, oscillators, and amplifiers.

32.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT ELECTRONIC NETWORKS AND SYSTEMS--
The student will be able to:

32.01 Define and describe telecommunications.
32.02 Conduct telecommunications experiments including receivers, transmitters, wirelines and antennas, telephones and fiber optics.

32.03 Describe the technology and organization of electronic guidance systems.
32.04 Perform technical skills in building, assembling, servicing, or operating one of the above systems.
32.05 Define and describe logic control.
32.06 Conduct a logic control experiment.
32.07 Define and describe digital communications.
32.08 Conduct a digital communications experiment.
32.09 Define and describe industrial controls.
32.10 Conduct an industrial controls experiment.

33.0 CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT ON AN ELECTRONIC SYSTEM OR PROCESS--
The student will be able to:

33.01 Identify a problem.
33.02 State a need to research the problem.
33.03 Form a hypothesis about the problem.
33.04 Plan the procedures for researching the problem.
33.05 Conduct the research following the planned procedures.
33.06 Present the research findings in a seminar.
33.07 State conclusions based on the research findings.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993
PROGRAM AREA: Technology Education COURSE CREDIT: 1
PROGRAM TITLE: Electronics Technology PROGRAM NUMBER: 8600900

COURSE TITLE: Electronics Technology I COURSE NUMBER: 8600910

COURSE DESCRIPTION:

This course provides students with an introduction to the knowledge, human relations, and technical skills of electronics technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.

03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--
The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
  -integers, fractions, and decimals;
  -ratios, proportions, and percentages;
  -roots and powers;
  -algebra;
  -geometry.
04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry. (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.

05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "Brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--
The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--
The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--
The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--
The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.

10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--
The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

12.0 DESCRIBE THE STRUCTURE OF MATTER RELATED TO ELECTRONICS--
The student will be able to:

12.01 Describe the composition of elements, mixtures, and compounds according to the electron theory.
12.02 List the atomic subparticles.
12.03 Diagram and show the relationship between electrons, protons, and neutrons.
12.04 State the law of electrical charges.
12.05 Describe the classification and characteristics of materials as they apply to conductor, insulators, and semiconductors.
12.06 Demonstrate proficiency in the identification of electronics symbols.

13.0 DESCRIBE, CONSTRUCT, CONDUCT, AND ANALYZE EXPERIMENTS WITH BASIC DC AND AC CIRCUITS AND WITH CIRCUITS USING MAGNETISM--
The student will be able to:

13.01 Solve math problems related to DC and AC circuits.
13.02 Define voltage, current, resistance, power, and energy.
13.03 Set up and test basic circuits.
13.04 Set up and operate multimeters in DC and AC circuits.
13.05 Set up and operate power supplies in DC circuits.
13.06 Describe magnetism, the law of magnetic poles, and the behavior of flux lines.
13.07 Demonstrate electromagnetism.
13.08 Construct simple circuits using a relay.

14.0 IDENTIFY, MEASURE, AND DESCRIBE THE FUNCTION OF TRANSFORMERS AND INDUCTORS IN ELECTRONIC CIRCUITS--
The student will be able to:

14.01 Explain the theory of operation and application of inductance in inductors and transformers.
14.02 Explain what an inductor is and what its purpose is.
14.03 Construct circuits using transformers and inductors.
14.04 Explain inductive reactance.

15.0 USE OHM'S LAW AND WATT'S LAW TO ANALYZE AND EXPERIMENT WITH RESISTIVE CIRCUITS--
The student will be able to:

15.01 Identify resistors by color code.
15.02 Identify and measure resistors.
15.03 Apply Ohm's law to circuits.
15.04 Explain how resistors are constructed.
15.05 Apply Watt's law to circuits.
15.06 Use a VOM to verify values.
15.07 Identify different types of resistors, and explain their use and ratings.

16.0 DESCRIBE, CONSTRUCT, ANALYZE AND EXPERIMENT WITH CAPACITIVE CIRCUITS--
The student will be able to:

16.01 Explain how a capacitor stores electrical energy.
16.02 Explain how a capacitor is constructed.
16.03 Explain capacitive reactance.

17.0 DEMONSTRATE THE USE OF ELECTRONIC EQUIPMENT--
The student will be able to:

17.01 Use a VOM to obtain accurate measurements.
17.02 Apply safety rules in the use of electronci instruments and demonstrate proper care and maintenance for the equipment during storage and use.
17.03 Use voltmeters, ammeters, and ohmmeters to obtain accurate measurements.
17.04 Set up and use an oscilloscope to observe waveforms and to determine the voltage of the signal presented.
17.05 Use signal generators to produce waveforms of selected frequencies and shapes.
17.06 Use testers to determine the condition of electronic components.

18.0 DEMONSTRATE PROPER ELECTRONIC ASSEMBLY METHODS--
The student will be able to:

18.01 Exhibit safe soldering techniques.
18.02 Identify proper soldering practices.
18.03 Demonstrate proper soldering applications.
18.04 Identify common electrical and electronics hand tools.
18.05 Demonstrate electronic component assembly.
18.06 Apply electrical tape to a spliced and soldered wire connection.
18.07 Solder and desolder components and wires.
18.08 Describe the two methods of making a printed circuit board.

19.0 DEMONSTRATE AN UNDERSTANDING OF BASIC ELECTRICAL CIRCUITS AND ELECTRONIC SYSTEMS--
The student will be able to

19.01 Identify problems and demonstrate appropriate solutions when dealing with series, series-parallel, parallel, voltage dividers, and network circuits.
19.02 Define electronic systems.

19.03 Describe the importance of electronic systems in today's technology world.
19.04 Define electronics input, process and output of electronic systems.
19.05 Conduct electronic experiments using input, process and output systems.
19.06 Describe, design and conduct experiments with electronic systems.

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1993
PROGRAM AREA:	Technology Education	COURSE CREDIT:	1
PROGRAM TITLE:	Electronics Technology	PROGRAM NUMBER:	8600900
COURSE TITLE:	Electronics Technology II	COURSE NUMBER:	8600920

COURSE DESCRIPTION:

This course provides students with an expanded study and application of the knowledge, human relation,s and technical skills of electroncis technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.

03.05 Comprehend and communicate information relevant to emerging technologies.

03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.

04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.

04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.

04.04 Distinguish fact from opinion.

04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.

04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.

04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.

04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.

04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.

04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.

04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.

04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.

04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.

04.14 Use the mathematics of:
-integers, fractions, and decimals;
-ratios, proportions, and percentages;
-roots and powers;
-algebra;
-geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.

04.16 Use elementary concepts of probability and statistics.

04.17 Draw, read, and analyze graphs, charts, and tables.

04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.

04.19 Organize and communicate the results obtained by observation and experimentation.

04.20 Apply the basic principles of biology, physics, and chemistry. (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).

04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.

05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "Brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--
The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--
The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--
The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--
The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.

10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--
The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

20.0 DESCRIBE THE STRUCTURE OF MATTER RELATED TO ELECTRONICS--
The student will be able to:

20.01 Describe the composition of element, mixtures, and compounds according to the electron theory.
20.02 List the atomic subparticles.
20.03 Diagram and show the relationship between electrons, protons, and neutrons.
20.04 State the law of electrical charges.

20.05 Describe the classification and characteristics of materials as they apply to conductors, insulators, and semiconductors.
20.06 Demonstrate proficiency in the identification of electronics symbols.

21.0 DESCRIBE, CONSTRUCT, CONDUCT, AND ANALYZE EXPERIMENTS WITH BASIC DC AND AC CIRCUITS AND WITH CIRCUITS USING MAGNETISM--
The student will be able to:

21.01 Solve electronic math problems related to DC and AC circuits.
21.02 Define voltage, current, resistance, power, and energy.
21.03 Set up and test basic circuits.
21.04 Set up and operate multimeters in DC and AC circuits.
21.05 Set up and operate power supplies in DC circuits.
21.06 Describe magnetism, the law of magnetic poles, and the behavior of flux lines.
21.07 Demonstrate electromagnetism.
21.08 Construct simple circuits using a relay.

22.0 IDENTIFY, MEASURE, AND DESCRIBE THE FUNCTION OF TRANSFORMERS AND INDUCTORS IN ELECTRONIC CIRCUITS--
The student will be able to:

22.01 Explain the theory of operation and application of inductance in inductors and transformers.
22.02 Explain what an inductor is and what its purpose is.
22.03 Construct circuits using transformers and inductors.
22.04 Explain inductive reactance.

23.0 USE OHM'S LAW AND WATT'S LAW TO ANALYZE AND EXPERIMENT WITH RESISTIVE CIRCUITS--
The student will be able to:

23.01 Identify resistors by color code.
23.02 Identify and measure resistors.
23.03 Apply Ohm's law to circuits.
23.04 Explain how resistors are constructed.
23.05 Apply Watt's law to circuits.
23.06 Use a VOM to verify values.
23.07 Identify different types of resistors, and explain their use ratings.

24.0 DESCRIBE, CONSTRUCT, ANALYZE AND EXPERIMENT WITH CAPACITIVE CIRCUITS--
The student will be able to:

24.01 Explain how a capacitor stores electrical energy.
24.02 Explain how a capacitor is constructed.
24.03 Explain capacitive reactance.

25.0 DESCRIBE AND EXPERIMENT WITH INTEGRATED CIRCUITS--
The student will be able to:

25.01 Explain what integrated circuits (IC's) are and how they are manufactured.
25.02 Explain the advantages of integrated circuits as compared to discrete component circuits.
25.03 Construct electronic circuits which contain ICs.
25.04 Describe the basic types of integrated circuit design, along with their pin numbering systems and dimensions.

26.0 DEMONSTRATE THE USE OF ELECTRONIC EQUIPMENT--
The student will be able to:

26.01 Use a VOM to obtain accurate measurements.
26.02 Apply safety rules in the use of electronic instruments and demonstrate proper care and maintenance for the equipment during storage and use.
26.03 Use voltmeters, ammeters, and ohmmeters to obtain accurate measurements.
26.04 Set up and use an oscilloscope to observe waveforms and to determine the voltage of the signal presented.
26.05 Use signal generators to produce waveforms of selected frequencies and shapes.
26.06 Use testers to determine the condition of electronic components.

27.0 DEMONSTRATE AN UNDERSTANDING OF BASIC ELECTRICAL CIRCUITS AND ELECTRONIC SYSTEMS--
The student will be able to:

27.01 Identify problems and demonstrate appropriate solutions when dealing with series, series-parallel, parallel, voltage dividers, and network circuits.
27.02 Define electronic systems.
27.03 Describe the importance of electronic systems in today's technology world.
27.04 Define electronic input, process and output of electronic systems.
27.05 Conduct electronic experiments using input, process and output systems.
27.06 Describe, design and conduct experiments with electronic systems.
27.07 Define and give an example of a super conductor.

28.0 DESCRIBE, CONSTRUCT, AND EXPERIMENT WITH CIRCUITS USING SEMICONDUCTORS--
The student will be able to:

28.01 Describe the general theory and application of semiconductor devices.
28.02 Explain the difference between N-type and P-type material.
28.03 Explain the precautions necessary when working with solid state devices.
28.04 Demonstrate the proper procedures for the installation of solid state components using thermal release devices (heat sinks).
28.05 Construct and experiment with semiconductor devices.
28.06 Construct and test circuits which contain solid state components such as FET'S, SCR's, UJT's, tunnel diodes, zener diodes, zener diodes, light emitting diodes, etc.

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1993
PROGRAM AREA:	Technology Education	COURSE CREDIT:	1
PROGRAM TITLE:	Electronics Technology	PROGRAM NUMBER:	8600900
COURSE TITLE:	Electronics Technology III	COURSE NUMBER:	8600930

COURSE DESCRIPTION:

This course provides students with an expanded study and application of the knowledge, human relation,s and technical skills of electroncis technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.

03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
  -integers, fractions, and decimals;
  -ratios, proportions, and percentages;
  -roots and powers;
  -algebra;
  -geometry.
04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry. (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.

05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "Brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--
The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--
The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--
The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--
The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.

10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--
The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

29.0 PERFORM ADVANCED STUDY AND SKILLS RELATED TO ELECTRONICS--
The student will be able to:

29.01 Select an individual or group project in cooperation with the teacher.
29.02 Develop a written plan of work to carry out the project.
29.03 Show evidence of technical study in support of the project.
29.04 Perform skills related to the project.
29.05 Complete the project as planned.

30.0 DEMONSTRATE AN UNDERSTANDING OF THE PRINCIPLES AND APPLICATIONS OF MICROCOMPUTER SYSTEMS--
The student will be able to:

30.01 Define microcomputer systems.
30.02 Describe the importance of microcomputer systems in today's technology world.
30.03 Describe microcomputer applications in today's technology world.
30.04 Define microcomputer interfacing.
30.05 Conduct microcomputer systems experiments.
30.06 Conduct microcomputer systems interfacing, sensing and control applications.

31.0 DESCRIBE, IDENTIFY, AND CORRECT PROBLEMS IN ELECTRONIC CIRCUITS--
The student will be able to:

31.01 Identify problems and demonstrate solutions when dealing with power supplies, oscillators, and amplifiers.

32.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT ELECTRONIC NETWORKS AND SYSTEMS--
The student will be able to:

32.01 Define and describe telecommunications.
32.02 Conduct telecommunications experiments including receivers, transmitters, wirelines and antennas, telephones and fiber optics.
32.03 Describe the technology and organization of electronic guidance systems.
32.04 Perform technical skills in building, assembling, servicing, or operating one of the above systems.
32.05 Define and describe logic control.
32.06 Conduct a logic control experiment.
32.07 Define and describe digital communications.
32.08 Conduct a digital communications experiment.
32.09 Define and describe industrial controls.
32.10 Conduct an industrial controls experiment.

33.0 CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT ON AN ELECTRONIC SYSTEM OR PROCESS--
The student will be able to:

33.01 Identify a problem.
33.02 State a need to research the problem.

33.03 Form a hypothesis about the problem.
33.04 Plan the procedures for researching the problem.
33.05 Conduct the research following the planned procedures.
33.06 Present the research findings in a seminar.
33.07 State conclusions based on the research findings.

CURRICULUM FRAMEWORK PROGRAM AREA: Technology Education

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Power and Transportation Technology

CODE NUMBER: Secondary 8601200 Postsecondary ______

Florida CIP 0821.010500

SECONDARY SCHOOL CREDITS 3 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS

APPLICABLE LEVEL(S): ____7-9 X 9-12 ____Postsecondary Adult Vocational

______ Postsecondary Vocational X Other 30, 31

CERTIFICATION COVERAGE: INDUS ARTS @ 4 @ 6 AUTO MECH @ 7 G TEC MECH @ 7 G
GEN SHOP @ 4 DIESEL MECH @ 7 G AIR MECH @ 7 G
TRANSPORT @ 4 AUTO IND @ 7 G GAS ENG RPR @ 7 G
I ART-TEC 1 @2

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to provide students with a foundation of knowledge and technically oriented experiences in the study of power and transportation technology.

The content includes, but is not limited to, a study of power systems and the kinds and sources of energy. The content and activities will also include the study of entrepreneurship, safety, and leadership skills.

Listed below are the courses that make up this program. Proposed design code 243 as shown in DVACE joint Memorandum 92-37 of May 27, 1992, is appropriate for this program.

8601210	Power and Transportation Technology I
8601220	Power and Transportation Technology II
8601230	Power and Transportation Technology III

II. LABORATORY ACTIVITIES: Instruction and learning activities are provided in a laboratory setting using hands-on experiences with the tools and materials appropriate to the course content.

III. SPECIAL NOTE: The Florida Technology Student Association (FL-TSA) is the appropriate vocational student organization for providing leadership training experiences and for reinforcing specific technology skills. When provided, these activities are considered an integral part of this instructional program.

The Level II and Level III courses in this program may articulate into postsecondary Tech-Prep 2 + 2 programs when taken in sequence. Tech-Prep 2 + 2 programs require articulation agreements between secondary and postsecondary educational agencies.

A proposed change to section 232.2467 F.S., Florida Gold Seal Vocational Endorsement would permit a student who "completed three credits in a sequential program of studies defined in an articulation agreement with a postsecondary institution(s) and leading to completion of a job preparatory program as defined by section 228.041 F.S." to be included. This would permit Technology Education students to participate in the Florida Gold Seal Vocational Endorsement.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate the ability to work safely with a variety of technologies.
02. Demonstrate interpersonal skills as they relate to the workplace.
03. Identify and apply methods of information acquisition and utilization.
04. Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.
05. Demonstrate and apply design/problem-solving processes.
06. Express an understanding of technological systems and their complex interrelationships.
07. Demonstrate the ability to properly identify, organize, plan, and allocate reources.
08. Discuss individual interests and aptitudes as they relate to a career.
09. Demonstrate employability skills.
10. Demonstrate an understanding of entrepreneurship.
11. Make an informed and meaningful career choice.
12. Describe sources of energy.
13. Demonstrate technical knowledge and skills about steam power technology.
14. Demonstrate technical knowledge and skills about diesel engine power technology.
15. Demonstrate technical knowledge and skills about internal combustion power technology.
16. Demonstrate technical knowledge and skills about hydraulic and pneumatic power technology.
17. Demonstrate technical knowledge and skills about electric power technology.
18. Demonstrate technical knowledge and skills about jet engine power technology.
19. Demonstrate technical knowledge and skills about rocket engine power technology.
20. Demonstrate technical knowledge and skills about solar cells and fuel cells.
21. Demonstrate technical knowledge and skills about nuclear power technology.
22. Perform advanced study and technical skills related to energy and power.
23. Operate a computer utilizing a program related to energy and power.
24. Demonstrate technical knowledge and skills about powered transportation systems.
25. Measure and report the power and efficiency of power producing systems.
26. Conduct a research and experimentation project on an energy and power system.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education SECONDARY NUMBER: 8601200

PROGRAM TITLE: Power and Transportation Technology

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evaluation.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.

04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.

04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.

04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
  -integers, fractions, and decimals;
  -ratios, proportions, and percentages;
  -roots and powers;
  -algebra;
  -geometry.
04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry. (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "Brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--
The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--
The student will be able to:

07.01 Demonntrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--
The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--
The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--
The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.

11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

12.0 DESCRIBE SOURCES OF ENERGY--

The student will be able to:

12.01 Describe sources of thermal energy.
12.02 Describe sources of radiant energy.
12.03 Describe sources of nuclear energy.
12.04 Describe sources of chemical energy.
12.05 Describe sources of electrical energy.
12.06 Describe sources of mechanical energy.
12.07 Describe sources of fluid energy.

13.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT STEAM POWER TECHNOLOGY

The student will be able to:

13.01 Identify and define the key terms, categories, and parts of steam power technology.
13.02 Describe the operating theory and principles of steam engines and steam turbines.
13.03 Explain the uses and applications of steam power engines and systems.
13.04 Identify industries that produce and use steam power systems.
13.05 Describe energy and fuel sources for steam power operations.
13.06 Perform technical skills in building, assembling, maintaining, or operating a steam power system.

14.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT DIESEL ENGINE POWER TECHNOLOGY--

The student will be able to:

14.01 Identify and define key terms, categories, and parts of diesel engine power technology.
14.02 Describe the operating theory and principles of diesel engine power technology.
14.03 Explain the uses and applications of diesel engines.
14.04 Identify industries that produce and use diesel engines.
14.05 Describe energy and fuel sources for diesel engines.
14.06 Perform technical skills in building, assembling, maintaining, or operating diesel engines.

15.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT INTERNAL COMBUSTION POWER TECHNOLOGY--

The student will be able to:

15.01 Identify and define the key terms, categories, and parts of gasoline engine internal combustion technology.
15.02 Describe the operating theory and principles of internal combustion gasoline engines.
15.03 Explain the uses and applications of internal combustion gasoline engines.
15.04 Identify industries that produce and use internal combustion gasoline engines.
15.05 Describe energy and fuel sources for internal combustion gasoline engines.
15.06 Perform technical skills in building, assembling, maintaining, or operating internal combustion gasoline engines.

16.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT HYDRAULIC AND PNEUMATIC POWER TECHNOLOGY--

The student will be able to:

16.01 Identify and define key terms, categories, and parts of hydraulic and pneumatic power technology.

16.02 Describe the operating theory and principles of hydraulic and pneumatic power technology.

16.03 Explain the uses and applications of hydraulic and pneumatic power systems.

16.04 Identify industries that produce and use hydraulic and pneumatic power systems.

16.05 Describe the energy sources for hydraulic and pneumatic power systems.

16.06 Perform technical skills in building, assembling, maintaining, or operating hydraulic and pneumatic power systems.

17.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT ELECTRIC POWER TECHNOLOGY--
The student will be able to:

17.01 Identify and define the key terms, categories, and parts of electric power technology.

17.02 Describe the operating theory and principles of electric power systems.

17.03 Explain the uses and applications of electric power systems.

17.04 Identify industries that produce and use electric power systems.

17.05 Describe energy and fuel sources for electric power systems.

17.06 Perform technical skills in building, assembling, maintaining, or operating an electric power system.

18.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT JET ENGINE POWER TECHNOLOGY--
The student will be able to:

18.01 Identify and define key terms, categories, and parts of jet engine power technology.

18.02 Describe the operating theory and principles of jet engine power technology.

18.03 Explain the uses and applications of jet engines.

18.04 Identify industries that produce and use jet engines.

18.05 Describe energy and fuel sources for jet engines.

18.06 Perform technical skills in building, assembling, maintaining, or operating jet engines.

19.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT ROCKET ENGINE POWER TECHNOLOGY--
The student will be able to:

19.01 Identify and define key terms, categories, and parts of rocket engine power technology.

19.02 Describe the operating theory and principles of rocket engine power technology.

19.03 Explain the uses and applications of rocket engines.

19.04 Identify industries that produce and use rocket engines.

19.05 Describe energy and fuel sources for rocket engines.

19.06 Perform technical skills in building, assembling, maintaining, or operating rocket engines.

20.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT SOLAR CELLS AND FUEL CELLS--
The student will be able to:

20.01 Identify and define key terms, categories, and parts of solar cell and fuel cell power technology.

20.02 Describe the operating theory and principles of solar cell and fuel cell power technology.

20.03 Explain the uses and applications of solar cell and fuel cell power technology.
20.04 Identify the industries that produce and use solar cell and fuel cell power systems.
20.05 Describe the energy and fuel sources for solar cell and fuel cell power systems.
20.06 Perform technical skills in building, assembling, maintaining, or operating solar cell or fuel cell systems.

21.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT NUCLEAR POWER TECHNOLOGY--
The student will be able to:

21.01 Identify and define the key terms, categories, and parts of nuclear power technology.
21.02 Describe the operating theory and principles of nuclear power systems.
21.03 Explain the uses and applications of nuclear power systems.
21.04 Identify industries that produce and use nuclear power systems.
21.05 Describe energy and fuel sources for nuclear power systems.
21.06 Perform technical skills in building, assembling, maintaining, or operating a simulated or real nuclear power system.

22.0 PERFORM ADVANCED-STUDY AND TECHNICAL SKILLS RELATED TO ENERGY AND POWER TECHNOLOGY--
The student will be able to:

22.01 Select an individual or group project in cooperation with the teacher.
22.02 Develop a written plan of work to carry out the project.
22.03 Show evidence of technical study in support of the project.
22.04 Perform skills related to the project.
22.05 Complete the project as planned.

23.0 OPERATE A COMPUTER UTILIZING A PROGRAM RELATED TO ENERGY AND POWER--
The student will be able to:

23.01 Collect or produce data on energy and power through the operation of a computer.

24.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT POWERED TRANSPORTATION SYSTEMS--
The student will be able to:

24.01 Identify and define key terms, categories, and parts of land, water, air, and space transportation systems.
24.02 Describe the theories and operating principles of land, water, air, and space transportation.
24.03 Explain the uses and applications of land, water, air and space transportation vehicles.
24.04 Identify industries that produce and use land, water, air, and space transportation vehicles.
24.05 Describe the energy and power systems used in land, water, air, and space vehicles.
24.06 Perform technical skills in building, assembling, servicing, or operating a complete transportation vehicle.

25.0 MEASURE AND REPORT THE POWER AND EFFICIENCY OF POWER PRODUCING SYSTEMS
The student will be able to:

25.01 Measure the power and efficiency of a mechanical system.
25.02 Measure the power and efficiency of a fluid system.
25.03 Measure the power and efficiency of an electrical system.
25.04 Measure the power and efficiency of a thermal system.

26.0 CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT ON AN INDUSTRIAL MATERIAL OR PROCESS--

The student will be able to:

26.01 Identify a problem.
26.02 State a need to research the problem.
26.03 Form a hypothesis about the problem.
26.04 Plan the procedures for researching the problem.
26.05 Conduct the research following the planned procedures.
26.06 Present the research findings in a seminar.
26.07 State conclusions based on the research findings.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education
COURSE CREDIT: 1

PROGRAM TITLE: Power and Transportation Technology
PROGRAM NUMBER: 8601200

COURSE TITLE: Power and Transportation Technology I
COURSE NUMBER: 8601210

COURSE DESCRIPTION:

This course provides students with an introduction to the knowledge, human relations, and technical skills of energy and power technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.

03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--
The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.

04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.

04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
-integers, fractions, and decimals;
-ratios, proportions, and percentages;
-roots and powers;
-algebra;
-geometry.
04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry. (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.

05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "Brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--
The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--
The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--
The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--
The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.

10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--

The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

12.0 DESCRIBE SOURCES OF ENERGY--

The student will be able to:

12.01 Describe sources of thermal energy.
12.02 Describe sources of radiant energy.
12.03 Describe sources of nuclear energy.
12.04 Describe sources of chemical energy.
12.05 Describe sources of electrical energy.
12.06 Describe sources of mechanical energy.
12.07 Describe sources of fluid energy.

13.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT STEAM POWER TECHNOLOGY

The student will be able to:

13.01 Identify and define the key terms, categories, and parts of steam power technology.
13.02 Describe the operating theory and principles of steam engines and steam turbines.
13.03 Explain the uses and applications of steam power engines and systems.
13.04 Identify industries that produce and use steam power systems.
13.05 Describe energy and fuel sources for steam power operations.
13.06 Perform technical skills in building, assembling, maintaining, or operating a steam power system.

14.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT DIESEL ENGINE POWER TECHNOLOGY--

The student will be able to:

14.01 Identify and define key terms, categories, and parts of diesel engine power technology.
14.02 Describe the operating theory and principles of diesel engine power technology.
14.03 Explain the uses and applications of diesel engines.
14.04 Identify industries that produce and use diesel engines.
14.05 Describe energy and fuel sources for diesel engines.
14.06 Perform technical skills in building, assembling, maintaining, or operating diesel engines.

15.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT INTERNAL COMBUSTION POWER TECHNOLOGY--

The student will be able to:

15.01 Identify and define the key terms, categories, and parts of gasoline engine internal combustion technology.
15.02 Describe the operating theory and principles of internal combustion gasoline engines.
15.03 Explain the uses and applications of internal combustion gasoline engines.
15.04 Identify industries that produce and use internal combustion gasoline engines.
15.05 Describe energy and fuel sources for internal combustion gasoline engines.

15.06 Perform technical skills in building, assembling, maintaining, or operating internal combustion gasoline engines.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education

COURSE CREDIT: 1

PROGRAM TITLE: Power and Transportation Technology

PROGRAM NUMBER: 8601200

COURSE TITLE: Power and Transportation Technology II

COURSE NUMBER: 8601220

COURSE DESCRIPTION:

This course provides students with an expanded study and application of the knowledge, human relations, and technical skills of energy and power technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

- 01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
- 01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
- 01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
- 01.04 Follow laboratory safety rules and procedures.
- 01.05 Demonstrate good housekeeping at work station within total laboratory.
- 01.06 Identify color-coding safety standards.
- 01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
- 01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

- 02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
- 02.02 Participate as a member of a team.
- 02.03 Teach others new skills.
- 02.04 Identify skills needed to serve clients/customers.
- 02.05 Demonstrate leadership skills.
- 02.06 Describe strategies necessary for negotiating agreements.
- 02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
- 02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
- 02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
- 02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

- 03.01 Define terms related to computers.
- 03.02 Identify and describe methods of information acquisition and evalution.
- 03.03 Discuss advantages and disadvantages in the application of technologies.
- 03.04 Produce a plan to organize and maintain information relevant to emerging technologies.

03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--
The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.

04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.

04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
  -integers, fractions, and decimals;
  -ratios, proportions, and percentages;
  -roots and powers;
  -algebra;
  -geometry.
04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry. (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "Brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--
The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--
The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--
The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--
The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.

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10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--
The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

16.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT HYDRAULIC AND PNEUMATIC POWER TECHNOLOGY--
The student will be able to:

16.01 Identify and define key terms, categories, and parts of hydraulic and pneumatic power technology.
16.02 Describe the operating theory and principles of hydraulic and pneumatic power technology.
16.03 Explain the uses and applications of hydraulic and pneumatic power systems.
16.04 Identify industries that produce and use hydraulic and pneumatic power systems.
16.05 Describe the energy sources for hydraulic and pneumatic power systems.
16.06 Perform technical skills in building, assembling, maintaining, or operating hydraulic and pneumatic power systems.

17.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT ELECTRIC POWER TECHNOLOGY--
The student will be able to:

17.01 Identify and define the key terms, categories, and parts of electric power technology.
17.02 Describe the operating theory and principles of electric power systems.
17.03 Explain the uses and applications of electric power systems.
17.04 Identify industries that produce and use electric power systems.
17.05 Describe energy and fuel sources for electric power systems.
17.06 Perform technical skills in building, assembling, maintaining, or operating an electric power system.

18.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT JET ENGINE POWER TECHNOLOGY--
The student will be able to:

18.01 Identify and define key terms, categories, and parts of jet engine power technology.
18.02 Describe the operating theory and principles of jet engine power technology.
18.03 Explain the uses and applications of jet engines.
18.04 Identify industries that produce and use jet engines.
18.05 Describe energy and fuel sources for jet engines.
18.06 Perform technical skills in building, assembling, maintaining, or operating jet engines.

19.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT ROCKET ENGINE POWER TECHNOLOGY--
The student will be able to:

19.01 Identify and define key terms, categories, and parts of rocket engine power technology.
19.02 Describe the operating theory and principles of rocket engine power technology.

19.03 Explain the uses and applications of rocket engines.
19.04 Identify industries that produce and use rocket engines.
19.05 Describe energy and fuel sources for rocket engines.
19.06 Perform technical skills in building, assembling, maintaining, or operating rocket engines.

20.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT SOLAR CELLS AND FUEL CELLS--
The student will be able to:

20.01 Identify and define key terms, categories, and parts of solar cell and fuel cell power technology.
20.02 Describe the operating theory and principles of solar cell and fuel cell power technology.
20.03 Explain the uses and applications of solar cell and fuel cell power technology.
20.04 Identify the industries that produce and use solar cell and fuel cell power systems.
20.05 Describe the energy and fuel sources for solar cell and fuel cell power systems.
20.06 Perform technical skills in building, assembling, maintaining, or operating solar cell or fuel cell systems.

21.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT NUCLEAR POWER TECHNOLOGY--
The student will be able to:

21.01 Identify and define the key terms, categories, and parts of nuclear power technology.
21.02 Describe the operating theory and principles of nuclear power systems.
21.03 Explain the uses and applications of nuclear power systems.
21.04 Identify industries that produce and use nuclear power systems.
21.05 Describe energy and fuel sources for nuclear power systems.
21.06 Perform technical skills in building, assembling, maintaining, or operating a simulated or real nuclear power system.

STUDENT PERFORMANCE STANDARDS　　EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education　　COURSE CREDIT: 1

PROGRAM TITLE: Power and Transportation Technology　　PROGRAM NUMBER: 8601200

COURSE TITLE: Power and Transportation Technology III　　COURSE NUMBER: 8601230

COURSE DESCRIPTION:

This course provides students with an advanced study and application of the knowledge, human relations, and technical skills of energy and power technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.

03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.

04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.

04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
 -integers, fractions, and decimals;
 -ratios, proportions, and percentages;
 -roots and powers;
 -algebra;
 -geometry.
04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry. (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "Brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--
The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--
The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--
The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--
The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.

10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--
The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

22.0 PERFORM ADVANCED-STUDY AND TECHNICAL SKILLS RELATED TO ENERGY AND POWER TECHNOLOGY--
The student will be able to:

22.01 Select an individual or group project in cooperation with the teacher.
22.02 Develop a written plan of work to carry out the project.
22.03 Show evidence of technical study in support of the project.
22.04 Perform skills related to the project.
22.05 Complete the project as planned.

23.0 OPERATE A COMPUTER UTILIZING A PROGRAM RELATED TO ENERGY AND POWER--
The student will be able to:

23.01 Collect or produce data on energy and power through the operation of a computer.

24.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS ABOUT POWERED TRANSPORTATION SYSTEMS--
The student will be able to:

24.01 Identify and define key terms, categories, and parts of land, water, air, and space transportation systems.
24.02 Describe the theories and operating principles of land, water, air, and space transportation.
24.03 Explain the uses and applications of land, water, air and space transportation vehicles.
24.04 Identify industries that produce and use land, water, air, and space transportation vehicles.
24.05 Describe the energy and power systems used in land, water, air, and space vehicles.
24.06 Perform technical skills in building, assembling, servicing, or operating a complete transportation vehicle.

25.0 MEASURE AND REPORT THE POWER AND EFFICIENCY OF POWER PRODUCING SYSTEMS
The student will be able to:

25.01 Measure the power and efficiency of a mechanical system.
25.02 Measure the power and efficiency of a fluid system.
25.03 Measure the power and efficiency of an electrical system.
25.04 Measure the power and efficiency of a thermal system.

26.0 CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT ON AN ENERGY AND POWER SYSTEM--
The student will be able to:

26.01 Identify a problem.
26.02 State a need to research the problem.
26.03 Form a hypothesis about the problem.
26.04 Plan the procedures for researching the problem.

26.05 Conduct the research following the planned procedures.
26.06 Present the research findings in a seminar.
26.07 State conclusions based on the research findings.

CURRICULUM FRAMEWORK PROGRAM AREA: Technology Education

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Communications Technology

CODE NUMBER: Secondary 8601000 Postsecondary ______

Florida CIP 0821.010600

SECONDARY SCHOOL CREDITS 3 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): _____7-9 X 9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational X Other 30, 31

CERTIFICATION COVERAGE: INDUS ARTS @ 4 @ 6 GRAPHIC ARTS @ 4
GEN SHOP @ 4 PRINTING @ 7 G
I ART-TEC 1 @2

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to provide students with a foundation of knowledge and technically oriented experiences in the study of communications technology.

The content includes, but is not limited to, a study of the processes, uses, and technical skills of graphic communication technology. The content and activities also include the study of entrepreneurship, safety, and leadership skills.

Listed below are the courses that make up this program. Proposed design code 243 as shown in DVACE joint Memorandum 92-37 of May 27, 1992, is appropriate for this program.

8601010	Communications Technology I
8601020	Communications Technology II
8601030	Communications Technology III

II. LABORATORY ACTIVITIES: Instruction and learning activities are provided in a laboratory setting using hands-on experiences with the tools and materials appropriate to the course content.

III. SPECIAL NOTE: The Florida Technology Student Association (FL-TSA) is the appropriate vocational student organization for providing leadership training experiences and for reinforcing specific technology skills. When provided, these activities are considered an integral part of this instructional program.

The Level II and Level III courses in this program may articulate into postsecondary Tech-Prep 2 + 2 programs when taken in sequence. Tech-Prep 2 + 2 programs require articulation agreements between secondary and postsecondary educational agencies.

A proposed change to section 232.2467 F.S., Florida Gold Seal Vocational Endorsement would permit a student who "completed three credits in a sequential program of studies defined in an articulation agreement with a postsecondary institution(s) and leading to completion of a job preparatory program as defined by section 228.041 F.S." to be included. This would permit Technology Education students to participate in the Florida Gold Seal Vocational Endorsement.

IV. INTENDED OUTCOMES: Outcomes 1 through 11 apply to each of the following courses. After successfully completing this program, the student will be able to:

01. Demonstrate the ability to work safely with a variety of technologies.
02. Demonstrate interpersonal skills as they relate to the workplace.
03. Identify and apply methods of information acquisition and utilization.
04. Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.
05. Demonstrate and apply design/problem-solving processes.
06. Express an understanding of technological systems and their complex interrelationships.
07. Demonstrate the ability to properly identify, organize, plan, and allocate reources.
08. Discuss individual interests and aptitudes as they relate to a career.
09. Demonstrate employability skills.
10. Demonstrate an understanding of entrepreneurship.
11. Make an informed and meaningful career choice.

8601010 - COMMUNICATIONS TECHNOLOGY I

12. Express a technical knowledge and understanding about major printing processes.
13. Describe the properties and specifications of printing materials.
14. Demonstrate technical knowledge and skills in the preparation of art and copy for printing reproduction.
15. Demonstrate technical knowledge and skills in graphic communications process photography.
16. Demonstrate technical knowledge and skills in the processes of platemaking.
17. Produce printed copies through the operation of a lithographic offset press.
18. Demonstrate technical knowledge and skills in screen process printing.
19. Express a technical knowledge and understanding about electronic communication technology.

8601020 - COMMUNICATIONS TECHNOLOGY II

20. Demonstrate technical knowledge and skills in binding and finishing processes.
21. Use technical knowledge and skills in continuous tone photography.
22. Apply technical knowledge and skills in the processes of multi-colored printing.
23. Perform advanced study and technical skills related to graphic communications technology.

8601030 - COMMUNICATIONS TECHNOLOGY III

24. Operate a computer utilizing a program related to graphic communications technology.
25. Demonstrate technical knowledge and skills in advanced printing procedures.
26. Demonstrate technical knowledge and skills in continuous-tone photography.
27. Conduct a research and experimentation project in graphic communications technology.

STUDENT PERFORMANCE STANDARDS   EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education   PROGRAM NUMBER: 8601000

PROGRAM TITLE: Communications Technology

COURSE DESCRIPTION:

This course provides students with an introduction to the knowledge, human relations and technical skills of graphic communications technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE

APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--
The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.

04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
-integers, fractions, and decimals;
-ratios, proportions, and percentages;
-roots and powers;
-algebra;
-geometry.
04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry. (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "Brainstorming" as a process to solve problems.

05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--
The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--
The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--
The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--
The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--
The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

8601010 - COMMUNICATIONS TECHNOLOGY I

12.0 EXPRESS A TECHNICAL KNOWLEDGE AND UNDERSTANDING ABOUT MAJOR PRINTING PROCESSES--
The student will be able to:

12.01 Explain the processes of relief, gravure, screen lithographic, electrostatic, and projection printing.
12.02 Explain the difference between printing and duplicating processes.

13.0 DESCRIBE THE PROPERTIES AND SPECIFICATIONS OF PRINTING MATERIALS--
The student will be able to:

13.01 Describe the types, sizes, quantities and properties of paper.
13.02 Explain the different ingredients and purposes of inks.
13.03 Describe the chemical properties and precautions of graphic arts solvents.

13.04 Describe the manufacturing technology and process in making paper and inks.
13.05 Explain the chemistry and specifications of photographic films and papers.

14.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN THE PREPARATION OF ART AND COPY FOR PRINTING REPRODUCTION--
The student will be able to:

14.01 Explain the principles of graphic communications layout and design.
14.02 Express an understanding of printers' measurements, proofreaders marks, and type styles.
14.03 Demonstrate the processes of cold type composition, phototypesetting, and computer generated type.
14.04 Explain the processes of copyfitting, cropping, and registering.
14.05 Apply the standard procedures and techniques in generating copy or paste-ups for printing reproduction.

15.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN GRAPHIC COMMUNICATIONS PROCESS PHOTOGRAPHY--
The student will be able to:

15.01 Identify different styles of process cameras.
15.02 Describe specifications and properties of graphic arts films, screens, and chemicals.
15.03 Display a knowledge of darkroom lighting and ventilation.
15.04 Apply the procedures for camera set up, exposing, film processing, correcting problems, and clean-up.
15.05 Produce a quality line and halftone negative.

16.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN THE PROCESSES OF PLATEMAKING--
The student will be able to:

16.01 Describe the processes for making letterpress and gravure plates.
16.02 Express knowledge about the types, styles, and properties of offset lithographic plates.
16.03 Explain the photomechanics of a photo-offset plate.
16.04 Apply the technical procedures for stripping a flat, generating direct and photo-offset plates, identifying and correcting

problems, and preserving and storing plates.
16.05 Produce a quality offset metal plate.

17.0 PRODUCE PRINTED COPIES THROUGH THE OPERATION OF A LITHOGRAPHIC OFFSET PRESS--
The student will be able to:

17.01 Identify the major systems and functions of an offset press.
17.02 Perform the standard procedure for operating an offset press, including makeready, operating procedures, identifying and correcting problems, and clean-up.
17.03 Produce a quality offset project.

18.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN SCREEN PROCESS PRINTING--
The student will be able to:

18.01 Describe the types of inks and screens for screen process printing.
18.02 Explain the substrate surfaces and materials commonly printed on through the screen printing process.
18.03 Describe the standard procedures for screen printing, including screen preparation, operating procedures, identifying and correcting problems, and clean-up.
18.04 Describe stencil making processes.
18.05 Produce a single color screen print.

19.0 EXPRESS A TECHNICAL KNOWLEDGE AND UNDERSTANDING ABOUT ELECTRONIC COMMUNICATIONS TECHNOLOGY--
The student will be able to:

19.01 Describe the theory and technical applications of telephone communications systems.
19.02 Describe the theory and technical processes of radio communications systems applications.
19.03 Describe the theory and technical processes of television communications systems.
19.04 Describe the theory and technical applications of digital data communications.
19.05 Describe the theory and technical applications of satellite communications.

8601020 - COMMUNICATIONS TECHNOLOGY II

20.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN BINDING AND FINISHING OPERATIONS--
The student will be able to:

20.01 Describe standard binding processes.
20.02 Explain die cutting.
20.03 Describe the processes of scoring, folding, gathering, and collating.
20.04 Describe the processes of hot stamping, laminating, perforating, punching, drilling, and thermography.
20.05 Demonstrate the proper and safe use of a paper cutter and trimmer.
20.06 Make a bound and finished printed product using the proper technical skills.

21.0 USE TECHNICAL KNOWLEDGE AND SKILLS IN CONTINUOUS-TONE PHOTOGRAPHY--
The student will be able to:

21.01 Describe the standard procedure for making a continuous-tone negative including camera operation, processing film, identifying and correcting problems, and clean-up.
21.02 Describe the standard procedure for making a continuous-tone print,

including darkroom operation, printing and processing, identifying and correcting problems, and clean-up.
21.03 Produce a quality negative.
21.04 Produce a quality print.

22.0 APPLY TECHNICAL KNOWLEDGE AND SKILLS IN THE PROCESSES OF MULTI-COLOR PRINTING--
The student will be able to:

22.01 Design and layout copy for multi-color registration and printing.
22.02 Use the proper technical skills in the layout, preparation, production, and finishing of a multi-colored offset printing job.
22.03 Use the proper technical skills in the layout, preparation, production, and finishing of a multi-colored screen process printed job.

23.0 PERFORM ADVANCED STUDY AND TECHNICAL SKILLS RELATED TO GRAPHIC COMMUNICATIONS TECHNOLOGY--
The student will be able to:

23.01 Select an individual or group project in cooperation with teacher.
23.02 Develop a written plan of work to carry out the project.
23.03 Show evidence of technical study in support of the project.
23.04 Perform skills related to the project.
23.05 Complete the project as planned.

8601030 - COMMUNICATIONS TECHNOLOGY III

24.0 OPERATE A COMPUTER UTILIZING A PROGRAM RELATED TO COMMUNICATIONS TECHNOLOGY--
The student will be able to:

24.01 Produce written copy utilizing a word processing program.
24.02 Produce and manipulate artwork utilizing a drawing program.
24.03 Utilize a desktop publishing program to produce camera ready copy.

25.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN ADVANCED PRINTING PROCEDURES--
The student will be able to:

25.01 Explain the photographic and lithographic theories and technical skills of color separation printing.
25.02 Explain the screen printing procedures for special materials and for different shaped objects.
25.03 Perform or set up a technical display of the color separation process.
25.04 Print a screen process job on a special shape, surface, or for a special purpose such as printed circuitry.

26.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN CONTINUOUS-TONE PHOTOGRAPHY--
The student will be able to:

26.01 Describe the theory and technical processes of producing colored prints and colored slides.
26.02 Describe the theory and technical practices of special-effects photography.
26.03 Describe the theory and technical applications of high-speed photography.
26.04 Produce a photographic study using the technical skills of color, special effects, or high speed photography.

27.0 CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT IN GRAPHIC COMMUNICATIONS TECHNOLOGY--

The student will be able to:

27.01 Identify a problem
27.02 State a need to research the problem.
27.03 Form a hypothesis about the problem.
27.04 Plan the procedures for researching the problem.
27.05 Conduct the research following the planned procedures.
27.06 Present the research findings in a seminar.
27.07 State conclusions based on the research findings.

STUDENT PERFORMANCE STANDARDS   EFFECTIVE DATE: July, 1993
PROGRAM AREA: Technology Education   COURSE CREDIT: 1
PROGRAM TITLE: Communications Technology   PROGRAM NUMBER: 8601000
COURSE TITLE: Communications Technology I   COURSE NUMBER: 8601010

COURSE DESCRIPTION:

This course provides students with an introduction to the knowledge, human relations and technical skills of graphic communications technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

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02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
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02.03 Teach others new skills.
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02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
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03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--

The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
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04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
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04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
  -integers, fractions, and decimals;
  -ratios, proportions, and percentages;
  -roots and powers;
  -algebra;
  -geometry.
04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry. (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--

The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.

05.05 Demonstrate "Brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--
The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--
The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--
The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--
The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--
The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

12.0 EXPRESS A TECHNICAL KNOWLEDGE AND UNDERSTANDING ABOUT MAJOR PRINTING PROCESSES--
The student will be able to:

12.01 Explain the processes of relief, gravure, screen lithographic, electrostatic, and projection printing.
12.02 Explain the difference between printing and duplicating processes.

13.0 DESCRIBE THE PROPERTIES AND SPECIFICATIONS OF PRINTING MATERIALS--
The student will be able to:

13.01 Describe the types, sizes, quantities and properties of paper.
13.02 Explain the different ingredients and purposes of inks.
13.03 Describe the chemical properties and precautions of graphic arts solvents.

13.04 Describe the manufacturing technology and process in making paper and inks.
13.05 Explain the chemistry and specifications of photographic films and papers.

14.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN THE PREPARATION OF ART AND COPY FOR PRINTING REPRODUCTION--
The student will be able to:

14.01 Explain the principles of graphic communications layout and design.
14.02 Express an understanding of printers' measurements, proofreaders marks, and type styles.
14.03 Demonstrate the processes of cold type composition, phototypesetting, and computer generated type.
14.04 Explain the processes of copyfitting, cropping, and registering.
14.05 Apply the standard procedures and techniques in generating copy or paste-ups for printing reproduction.

15.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN GRAPHIC COMMUNICATIONS PROCESS PHOTOGRAPHY--
The student will be able to:

15.01 Identify different styles of process cameras.
15.02 Describe specifications and properties of graphic arts films, screens, and chemicals.
15.03 Display a knowledge of darkroom lighting and ventilation.
15.04 Apply the procedures for camera set up, exposing, film processing, correcting problems, and clean-up.
15.05 Produce a quality line and halftone negative.

16.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN THE PROCESSES OF PLATEMAKING--
The student will be able to:

16.01 Describe the processes for making letterpress and gravure plates.
16.02 Express knowledge about the types, styles, and properties of offset lithographic plates.
16.03 Explain the photomechanics of a photo-offset plate.

16.04 Apply the technical procedures for stripping a flat, generating direct and photo-offset plates, identifying and correcting problems, and preserving and storing plates.
16.05 Produce a quality offset metal plate.

17.0 PRODUCE PRINTED COPIES THROUGH THE OPERATION OF A LITHOGRAPHIC OFFSET PRESS--
The student will be able to:

17.01 Identify the major systems and functions of an offset press.
17.02 Perform the standard procedure for operating an offset press, including makeready, operating procedures, identifying and correcting problems, and clean-up.
17.03 Produce a quality offset project.

18.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN SCREEN PROCESS PRINTING--
The student will be able to:

18.01 Describe the types of inks and screens for screen process printing.
18.02 Explain the substrate surfaces and materials commonly printed on through the screen printing process.
18.03 Describe the standard procedures for screen printing, including screen preparation, operating procedures, identifying and correcting problems, and clean-up.
18.04 Describe stencil making processes.
18.05 Produce a single color screen print.

19.0 EXPRESS A TECHNICAL KNOWLEDGE AND UNDERSTANDING ABOUT ELECTRONIC COMMUNICATIONS TECHNOLOGY--
The student will be able to:

19.01 Describe the theory and technical applications of telephone communications systems.
19.02 Describe the theory and technical processes of radio communications systems applications.
19.03 Describe the theory and technical processes of television communications systems.
19.04 Describe the theory and technical applications of digital data communications.
19.05 Describe the theory and technical applications of satellite communications.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993
PROGRAM AREA: Technology Education COURSE CREDIT: 1
PROGRAM TITLE: Communications Technology PROGRAM NUMBER: 8601000
COURSE TITLE: Communications Technology II COURSE NUMBER: 8601020

COURSE DESCRIPTION:

This course provides students with an expanded study and application of the knowledge, human relations, and technical skills of graphic communications technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.

03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--
The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
  -integers, fractions, and decimals;
  -ratios, proportions, and percentages;
  -roots and powers;
  -algebra;
  -geometry.
04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry. (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.

05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "Brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--

The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--

The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--

The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--

The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--

The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--

The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

20.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN BINDING AND FINISHING OPERATIONS--

The student will be able to:

20.01 Describe standard binding processes.
20.02 Explain die cutting.
20.03 Describe the processes of scoring, folding, gathering, and collating.
20.04 Describe the processes of hot stamping, laminating, perforating, punching, drilling, and thermography.
20.05 Demonstrate the proper and safe use of a paper cutter and trimmer.
20.06 Make a bound and finished printed product using the proper technical skills.

21.0 USE TECHNICAL KNOWLEDGE AND SKILLS IN CONTINUOUS-TONE PHOTOGRAPHY--

The student will be able to:

21.01 Describe the standard procedure for making a continuous-tone negative including camera operation, processing film, identifying and correcting problems, and clean-up.
21.02 Describe the standard procedure for making a continous-tone print, including darkroom operation, printing and processing, identifying and correcting problems, and clean-up.
21.03 Produce a quality negative.
21.04 Produce a quality print.

22.0 APPLY TECHNICAL KNOWLEDGE AND SKILLS IN THE PROCESSES OF MULTI-COLOR PRINTING--

The student will be able to:

22.01 Design and layout copy for multi-color registration and printing.
22.02 Use the proper technical skills in the layout, preparation, production, and finishing of a multi-colored offset printing job.
22.03 Use the proper technical skills in the layout, preparation, production, and finishing of a multi-colored screen process printed job.

23.0 PERFORM ADVANCED STUDY AND TECHNICAL SKILLS RELATED TO GRAPHIC COMMUNICATIONS TECHNOLOGY--

The student will be able to:

23.01 Select an individual or group project in cooperation with teacher.
23.02 Develop a written plan of work to carry out the project.
23.03 Show evidence of technical study in support of the project.
23.04 Perform skills related to the project.
23.05 Complete the project as planned.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education
COURSE CREDIT: 1

PROGRAM TITLE: Communications Technology
PROGRAM NUMBER: 8601000

COURSE TITLE: Communications Technology III
COURSE NUMBER: 8601030

COURSE DESCRIPTION:

This course provides students with an advanced study and application of the knowledge, human relations, and technical skills of graphic communications technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.

03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--
The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
  -integers, fractions, and decimals;
  -ratios, proportions, and percentages;
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The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.

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05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "Brainstorming" as a process to solve problems.
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The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
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The student will be able to:

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10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--
The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

24.0 OPERATE A COMPUTER UTILIZING A PROGRAM RELATED TO COMMUNICATIONS TECHNOLOGY--
The student will be able to:

24.01 Produce written copy utilizing a word processing program.
24.02 Produce and manipulate artwork utilizing a drawing program.
24.03 Utilize a desktop publishing program to produce camera ready copy.

25.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN ADVANCED PRINTING PROCEDURES--
The student will be able to:

25.01 Explain the photographic and lithographic theories and technical skills of color separation printing.
25.02 Explain the screen printing procedures for special materials and for different shaped objects.
25.03 Perform or set up a technical display of the color separation process.
25.04 Print a screen process job on a special shape, surface, or for a special purpose such as printed circuitry.

26.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN CONTINUOUS-TONE PHOTOGRAPHY--
The student will be able to:

26.01 Describe the theory and technical processes of producing colored prints and colored slides.
26.02 Describe the theory and technical practices of special-effects photography.
26.03 Describe the theory and technical applications of high-speed photography.
26.04 Produce a photographic study using the technical skills of color, special effects, or high speed photography.

27.0 CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT IN GRAPHIC COMMUNICATIONS TECHNOLOGY--
The student will be able to:

27.01 Identify a problem
27.02 State a need to research the problem.
27.03 Form a hypothesis about the problem.
27.04 Plan the procedures for researching the problem.
27.05 Conduct the research following the planned procedures.
27.06 Present the research findings in a seminar.
27.07 State conclusions based on the research findings.

CURRICULUM FRAMEWORK PROGRAM AREA: Technology Education

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Principles of Materials and Processes Technology

CODE NUMBER: Secondary 8601100 Postsecondary ______

Florida CIP 0821.010700

SECONDARY SCHOOL CREDITS 3 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____ 7-9 X 9-12 ____ Postsecondary Adult Vocational

____ Postsecondary Vocational X Other 30, 31

CERTIFICATION COVERAGE: INDUS ARTS @ 4 @ 6 WOODWORK @ 4
METALS @ 4 GEN SHOP @ 4
I ART-TEC 1 @2

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to provide students with a foundation of knowledge and technically oriented experiences in the study of the technology of materials and processes.

The content includes, but is not limited to, a study of the preprocessing, processing, and postprocessing of wood, metal, plastic, composite, and other materials. The content and activities will also include the study of entrepreneurship, safety, and leadership skills.

Listed below are the courses that make up this program. Proposed design code 243 as shown in DVACE joint Memorandum 92-37 of May 27, 1992, is appropriate for this program.

8601110	Basic Principles of Materials and Processes Technology
8601120	Intermediate Principles of Materials and Processes Technology
8601130	Advanced Principles of Materials and Processes Technology

II. LABORATORY ACTIVITIES: Instruction and learning activities are provided in a laboratory setting using hands-on experiences with the tools and materials appropriate to the course content.

III. SPECIAL NOTE: The Florida Technology Student Association (FL-TSA) is the appropriate vocational student organization for providing leadership training experiences and for reinforcing specific technology skills. When provided, these activities are considered an integral part of this instructional program.

The Intermediate and Advance courses in this program may articulate into postsecondary Tech-Prep 2 + 2 programs when taken in sequence. Tech-Prep 2 + 2 programs require articulation agreements between secondary and postsecondary educational agencies.

A proposed change to section 232.2467 F.S., Florida Gold Seal Vocational Endorsement would permit a student who "completed three credits in a sequential program of studies defined in an articulation agreement with a postsecondary institution(s) and leading to completion of a job preparatory program as defined by section 228.041 F.S." to be included. This would permit Technology Education students to participate in the Florida Gold Seal Vocational Endorsement.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate the ability to work safely with a variety of technologies.
02. Demonstrate interpersonal skills as they relate to the workplace.
03. Identify and apply methods of information acquisition and utilization.
04. Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.
05. Demonstrate and apply design/problem-solving processes.
06. Express an understanding of technological systems and their complex interrelationships.
07. Demonstrate the ability to properly identify, organize, plan, and allocate reources.
08. Discuss individual interests and aptitudes as they relate to a career.
09. Demonstrate employability skills.
10. Demonstrate an understanding of entrepreneurship.
11. Make an informed and meaningful career choice.
12. Define the processes related to materials technology.
13. Describe preprocessing activities and practices of materials technology.
14. Describe processing technologies and practices of industrial materials.
15. Describe postprocessing activities and practices of industrial materials.
16. Perform industrial materials preprocessing skills.
17. Perform technical processing skills with wood materials.
18. Perform technical processing skills with metal materials.
19. Perform technical processing skills with plastic materials.
20. Perform technical processing skills with other industrial materials such as composite materials, synthetic materials, fiberglass, glass, ceramics, cement, paper, rubber, petroleum, polymers and other industrial materials.
21. Perform industrial materials postprocessing skills.
22. Perform advanced study and technical skills related to materials and processes.
23. Operate a computer utilizing a program related to industrial materials.
24. Perform materials testing skills.
25. Perform a materials processing operation using a CNC (computer numerical controlled) machine.
26. Conduct a research and experimentation project on a material or process.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education SECONDARY NUMBER: 8601100

PROGRAM TITLE: Principles of Materials & Processes Technology

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evaluation.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
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04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.

04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.

04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
 -integers, fractions, and decimals;
 -ratios, proportions, and percentages;
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 -algebra;
 -geometry.
04.15 Make estimates and approximations, and judge the reasonableness of a result.
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04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry. (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "Brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--
The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
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06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--
The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
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The student will be able to:

09.01 Conduct a job search.
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The student will be able to:

10.01 Define entrepreneurship.
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10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--
The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.

11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

12.0 DEFINE THE PROCESSES RELATED TO INDUSTRIAL MATERIALS--
The student will be able to:

12.01 Define "preprocessing."
12.02 Define "processing."
12.03 Define "postprocessing."

13.0 DESCRIBE PREPROCESSING ACTIVITIES AND PRACTICES OF INDUSTRIAL MATERIALS
The student will be able to:

13.01 Describe the technical processes of extracting materials from natural resources.
13.02 Describe sources of standard stock materials.
13.03 Describe processes for transporting industrial materials.
13.04 Describe processes for storing industrial materials.
13.05 Describe industrial processes for protecting materials.
13.06 Describe precautions in receiving, unpacking, and handling industrial materials.

14.0 DESCRIBE PROCESSING TECHNOLOGIES AND PRACTICES OF INDUSTRIAL MATERIALS
The student will be able to:

14.01 Describe materials separating processes.
14.02 Describe materials forming processes.
14.03 Describe materials combining processes.
14.04 Describe materials conditioning processes.

15.0 DESCRIBE POSTPROCESSING TECHNOLOGIES AND PRACTICES OF INDUSTRIAL MATERIALS--
The student will be able to:

15.01 Describe processes for distributing products made of industrial materials.
15.02 Describe processes for installing products made of industrial materials.
15.03 Describe processes for maintaining products made of industrial materials.
15.04 Describe processes for altering products made of industrial materials.
15.05 Describe processes for servicing products made of industrial materials.

16.0 PERFORM INDUSTRIAL MATERIALS PREPROCESSING SKILLS--
The student will be able to:

16.01 Locate and order industrial materials.
16.02 Arrange for the appropriate transportation of industrial materials.
16.03 Store and protect industrial materials properly.
16.04 Follow proper precautions in the receiving, unpacking, and handling of industrial materials.

17.0 PERFORM TECHNICAL PROCESSING SKILLS WITH WOOD MATERIALS--
The student will be able to:

17.01 Apply the technical processes of separating and forming wood materials.
17.02 Apply the technical processes of conditioning wood materials.
17.03 Apply the technical processes of combining in the fabrication and finishing of a wood product.

18.0 PERFORM TECHNICAL PROCESSING SKILLS WITH METAL MATERIALS--
The student will be able to:

18.01 Apply the technical processes of separating and forming metal materials.
18.02 Apply the technical processes of conditioning metal materials.
18.03 Apply the technical processes of combining in the fabrication and finishing of a metal product.

19.0 PERFORM TECHNICAL PROCESSING SKILLS WITH PLASTIC MATERIALS--
The student will be able to:

19.01 Apply the technical processes of separating and forming plastic materials.
19.02 Apply the technical processing of conditioning plastic materials.
19.03 Apply the technical processes of combining in the fabrication and finishing of a plastic product.

20.0 PERFORM TECHNICAL PROCESSING SKILLS WITH OTHER INDUSTRIAL MATERIALS SUCH AS COMPOSITE MATERIALS, SYNTHETIC MATERIALS, FIBERGLASS, GLASS, CERAMICS, CEMENT, PAPER, RUBBER, PETROLEUM, POLYMERS AND OTHER INDUSTRIAL MATERIALS
The student will be able to:

20.01 Apply the technical processes of separating and forming other industrial materials.

20.02 Apply the technical processes of conditioning other industrial materials.
20.03 Apply the technical processes of combining in the fabrication and finishing of other industrial materials.

21.0 PERFORM INDUSTRIAL MATERIALS POSTPROCESSING SKILLS--
The student will be able to:

21.01 Install a product made of industrial materials.
21.02 Perform technical maintenance on a product made of industrial materials.
21.03 Plan and design a technical alteration in a product made of industrial materials.
21.04 Identify businesses that specialize in the technical service of products made of industrial materials.

22.0 PERFORM ADVANCED STUDY AND TECHNICAL SKILLS RELATED TO INDUSTRIAL MATERIALS AND PROCESSES--
The student will be able to:

22.01 Select an individual or group project in cooperation with the teacher.
22.02 Develop a written plan of work to carry out the project.
22.03 Show evidence of technical study in support of the project.
22.04 Perform skills related to the project.
22.05 Complete the project as planned.

23.0 OPERATE A COMPUTER UTILIZING A PROGRAM RELATED TO INDUSTRIAL MATERIALS
The student will be able to:

23.01 Collect or produce data on industrial materials or processes through the operation of a computer.

24.0 PERFORM MATERIALS TESTING SKILLS--
The student will be able to:

24.01 Perform technical destructive tests on industrial materials.

24.02 Perform technical nondestructive tests on industrial materials.

25.0 PERFORM A MATERIALS PROCESSING OPERATION USING A CNC (COMPUTER NUMERICAL CONTROLLED) MACHINE--
The student will be able to:

25.01 Separate, form, or combine a part or subpart of a project using a CNC machine.
25.02 Interface a CNC machine and a robotic arm to perform an automation process.

26.0 CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT ON AN INDUSTRIAL MATERIAL OR PROCESS--
The student will be able to:

26.01 Identify a problem.
26.02 State a need to research the problem.
26.03 Form a hypothesis about the problem.
26.04 Plan the procedures for researching the problem.
26.05 Conduct the research following the planned procedures.
26.06 Present the research findings in a seminar.
26.07 State conclusions based on the research findings.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education COURSE CREDIT: 1

PROGRAM TITLE: Principles of Materials and Processes Technology PROGRAM NUMBER: 8601100

COURSE TITLE: Basic Principles of Materials and Processes Technology COURSE NUMBER: 8601110

COURSE DESCRIPTION:

This course provides students with an introduction to the knowledge, human relations, and technical skills of industrial materials and processes technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.

03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--
The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
 -integers, fractions, and decimals;
 -ratios, proportions, and percentages;
 -roots and powers;
 -algebra;
 -geometry.
04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry. (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.

05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "Brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--
The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--
The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--
The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--
The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.

10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--
The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

12.0 DEFINE THE PROCESSES RELATED TO INDUSTRIAL MATERIALS--
The student will be able to:

12.01 Define "preprocessing."
12.02 Define "processing."
12.03 Define "postprocessing."

13.0 DESCRIBE PREPROCESSING ACTIVITIES AND PRACTICES--
The student will be able to:

13.01 Describe the technical processes of extracting materials from natural resources.
13.02 Describe sources of standard stock materials.
13.03 Describe processes for transporting industrial materials.
13.04 Describe processes for storing industrial materials.
13.05 Describe industrial processes for protecting materials.
13.06 Describe precautions in receiving, unpacking, and handling industrial materials.

14.0 DESCRIBE PROCESSING TECHNOLOGIES AND PRACTICES OF INDUSTRIAL MATERIALS
The student will be able to:

14.01 Describe materials separating processes.
14.02 Describe materials forming processes.
14.03 Describe materials combining processes.
14.04 Describe materials conditioning processes.

15.0 DESCRIBE POSTPROCESSING TECHNOLOGIES AND PRACTICES OF INDUSTRIAL MATERIALS--
The student will be able to:

15.01 Describe processes for distributing products made of industrial materials.
15.02 Describe processes for installing products made of industrial materials.
15.03 Describe processes for maintaining products made of industrial materials.
15.04 Describe processes for altering products made of industrial materials.
15.05 Describe processes for servicing products made of industrial materials.

16.0 PERFORM INDUSTRIAL MATERIALS PREPROCESSING SKILLS--
The student will be able to:

16.01 Locate and order industrial materials.
16.02 Arrange for the appropriate transportation of industrial materials.
16.03 Store and protect industrial materials properly.
16.04 Follow proper precautions in the receiving, unpacking, and handling of industrial materials.

17.0 PERFORM TECHNICAL PROCESSING SKILLS WITH WOOD MATERIALS--
The student will be able to:

17.01 Apply the technical processes of separating and forming wood materials.
17.02 Apply the technical processes of conditioning wood materials.
17.03 Apply the technical processes of combining in the fabrication and finishing of a wood product.

18.0 PERFORM TECHNICAL PROCESSING SKILLS WITH METAL MATERIALS--
The student will be able to:

18.01 Apply the technical processes of separating and forming metal materials.
18.02 Apply the technical processes of conditioning metal materials.
18.03 Apply the technical processes of combining in the fabrication and finishing of a metal product.

19.0 PERFORM TECHNICAL PROCESSING SKILLS WITH PLASTIC MATERIALS--
The student will be able to:

19.01 Apply the technical processes of separating and forming plastic materials.
19.02 Apply the technical processes of conditioning plastic materials.
19.03 Apply the technical processes of combining in the fabrication and finishing of a plastic product.

STUDENT PERFORMANCE STANDARDS
EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education
COURSE CREDIT: 1

PROGRAM TITLE: Principles of Materials and Processes Technology
PROGRAM NUMBER: 8601100

COURSE TITLE: Intermediate Principles of Materials & Processes Technology
COURSE NUMBER: 8601120

COURSE DESCRIPTION:

This course provides students with an expanded study and application of the knowledge, human relations, and technical skills of industrial materials and processes technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.

03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--

The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
  -integers, fractions, and decimals;
  -ratios, proportions, and percentages;
  -roots and powers;
  -algebra;
  -geometry.
04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry. (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--

The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.

05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "Brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--
The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--
The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--
The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--
The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.

10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--
The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

16.0 PERFORM INDUSTRIAL MATERIALS PREPROCESSING SKILLS--
The student will be able to:

16.01 Locate and order industrial materials.
16.02 Arrange for the appropriate transportation of industrial materials.
16.03 Store and protect industrial materials properly.
16.04 Follow proper precautions in the receiving, unpacking, and handling of industrial materials.

17.0 PERFORM TECHNICAL PROCESSING SKILLS WITH WOOD MATERIALS--
The student will be able to:

17.01 Apply the technical processes of separating and forming wood materials.
17.02 Apply the technical processes of conditioning wood materials.
17.03 Apply the technical processes of combining in the fabrication and finishing of a wood product.

18.0 PERFORM TECHNICAL PROCESSING SKILLS WITH METAL MATERIALS--
The student will be able to:

18.01 Apply the technical processes of separating and forming metal materials.
18.02 Apply the technical processes of conditioning metal materials.
18.03 Apply the technical processes of combining in the fabrication and finishing of a metal product.

19.0 PERFORM TECHNICAL PROCESSING SKILLS WITH PLASTIC MATERIALS--
The student will be able to:

19.01 Apply the technical processes of separating and forming plastic materials.
19.02 Apply the technical processing of conditioning plastic materials.
19.03 Apply the technical processes of combining in the fabrication and finishing of a plastic product.

20.0 PERFORM TECHNICAL PROCESSING SKILLS WITH OTHER INDUSTRIAL MATERIALS SUCH AS COMPOSITE MATERIALS, SYNTHETIC MATERIALS, FIBERGLASS, GLASS, CERAMICS, CEMENT, PAPER, RUBBER, PETROLEUM, POLYMERS AND OTHER INDUSTRIAL MATERIALS
The student will be able to:

20.01 Apply the technical processes of separating and forming other industrial materials.

20.02 Apply the technical processes of conditioning other industrial materials.
20.03 Apply the technical processes of combining in the fabrication and finishing of other industrial materials.

21.0 PERFORM INDUSTRIAL MATERIALS POSTPROCESSING SKILLS--
The student will be able to:

21.01 Install a product made of industrial materials.
21.02 Perform technical maintenance on a product made of industrial materials.
21.03 Plan and design a technical alteration in a product made of industrial materials.
21.04 Identify businesses that specialize in the technical service of products made of industrial materials.

23.0 OPERATE A COMPUTER UTILIZING A PROGRAM RELATED TO INDUSTRIAL MATERIALS
The student will be able to:

23.01 Collect or produce data on industrial materials or processes through the operation of a computer.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education — COURSE CREDIT: 1

PROGRAM TITLE: Principles of Materials and Processes Technology — PROGRAM NUMBER: 8601100

COURSE TITLE: Advanced Principles of Materials and Processes Technology — COURSE NUMBER: 8601130

COURSE DESCRIPTION:

This course provides students with an advanced study and application of the knowledge, human relations, and technical skills of industrial materials and processes technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.

03.04 Produce a plan to organize and maintain information relevant to emerging technologies.

03.05 Comprehend and communicate information relevant to emerging technologies.

03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.

04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.

04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.

04.04 Distinguish fact from opinion.

04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.

04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.

04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.

04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.

04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.

04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.

04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.

04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.

04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.

04.14 Use the mathematics of:
-integers, fractions, and decimals;
-ratios, proportions, and percentages;
-roots and powers;
-algebra;
-geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.

04.16 Use elementary concepts of probability and statistics.

04.17 Draw, read, and analyze graphs, charts, and tables.

04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.

04.19 Organize and communicate the results obtained by observation and experimentation.

04.20 Apply the basic principles of biology, physics, and chemistry. (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).

04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "Brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--
The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--
The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--
The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--
The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.

10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--
The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

22.0 PERFORM ADVANCED STUDY AND TECHNICAL SKILLS RELATED TO INDUSTRIAL MATERIALS AND PROCESSES--
The student will be able to:

22.01 Select an individual or group project in cooperation with the teacher.
22.02 Develop a written plan of work to carry out the project.
22.03 Show evidence of technical study in support of the project.
22.04 Perform skills related to the project.
22.05 Complete the project as planned.

23.0 OPERATE A COMPUTER UTILIZING A PROGRAM RELATED TO INDUSTRIAL MATERIALS
The student will be able to:

23.01 Collect or produce data on industrial materials or processes through the operation of a computer.

24.0 PERFORM MATERIALS TESTING SKILLS--
The student will be able to:

24.01 Perform technical destructive tests on industrial materials.
24.02 Perform technical nondestructive tests on industrial materials.

25.0 PERFORM A MATERIALS PROCESSING OPERATION USING A CNC (COMPUTER NUMERICAL CONTROLLED) MACHINE--
The student will be able to:

25.01 Separate, form, or combine a part or subpart of a project using a CNC machine.
25.02 Interface a CNC machine and a robotic arm to perform automation processes.

26.0 CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT ON AN INDUSTRIAL MATERIAL OR PROCESS--
The student will be able to:

26.01 Identify a problem.
26.02 State a need to research the problem.
26.03 Form a hypothesis about the problem.
26.04 Plan the procedures for researching the problem.
26.05 Conduct the research following the planned procedures.
26.06 Present the research findings in a seminar.
26.07 State conclusions based on the research findings.

CURRICULUM FRAMEWORK PROGRAM AREA: Technology Education

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Engineering Technology

CODE NUMBER: Secondary 8601300

Florida CIP 0821.010800

SECONDARY SCHOOL CREDITS 3 COLLEGE CREDITS ___ POSTSECONDARY ADULT VOCATIONAL CREDITS ___

APPLICABLE LEVEL(S): ___ 7-9 X 9-12 ___ Postsecondary Adult Vocational

Postsecondary Vocational ___ X Other 30, 31

CERTIFICATION COVERAGE: I ART-TEC 1 @2 INDUS ARTS @4 @6

I. MAJOR CONCEPTS/CONTENTS: The purpose of this program is to prepare students in the concepts and practices that underlie engineering and related careers. The program integrates the high-technology applications of mathematics and science concepts into pre-engineering activities. The challenges of a career as an engineer, technologist or technician are explored.

The content includes, but is not limited to, a study of the application of mechanical, fluid, electrical and thermal concepts, mathematics, chemistry, physics, computer application, and technical skills of engineering technology. The content and activities will also include the study of entrepreneurship, work group organization, work breakdown structures, legal and ethical constraints on the practice of engineering, safety and leadership skills.

Listed below are the courses that make up this program. Proposed design code 243 as shown in DVACE joint Memorandum 92-37 of May 27, 1992, is appropriate for this program.

8601310	Engineering Technology I
8601320	Engineering Technology II
8601330	Engineering Technology III

II. LABORATORY ACTIVITIES: Instruction and learning activities are provided in a laboratory setting to enable students to experience competencies relevant to engineering principles such as problem solving, materials processing, materials science, and the enterprise system resulting in occupational development useful to the future engineer, technician, technologist, and those planning related careers.

The Level II and Level III courses in this program may articulate into postsecondary Tech-Prep 2 + 2 programs when taken in sequence. Tech-Prep 2 + 2 programs require articulation agreements between secondary and postsecondary educational agencies.

A proposed change to section 232.2467 F.S., Florida Gold Seal Vocational Endorsement would permit a student who "completed three credits in a sequential program of studies defined in an articulation agreement with a postsecondary institution(s) and leading to completion of a job preparatory program as defined by section 228.041 F.S." to be included. This would permit Technology Education students to participate in the Florida Gold Seal Vocational Endorsement.

III. SPECIAL NOTE: The Florida Technology Student Association (FL-TSA) is the appropriate student organization for providing leadership training experiences and for reinforcing specific technology skills. It is strongly suggested that partnerships with the Florida Engineering Society be established to obtain practicing engineers as speakers. When provided, these activities are considered an integral part of this instructional program.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate the ability to work safely with a variety of technologies.
02. Demonstrate interpersonal skills as they relate to the workplace.
03. Identify and apply methods of information acquisition and utilization.
04. Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.
05. Demonstrate and apply design/problem-solving processes.
06. Express an understanding of technological systems and their complex interrelationships.
07. Demonstrate the ability to properly identify, organize, plan, and allocate reources.
08. Discuss individual interests and aptitudes as they relate to a career.
09. Demonstrate employability skills.
10. Demonstrate an understanding of entrepreneurship and invention.
11. Make an informed and meaningful career choice.
12. Demonstrate and apply fluid system principles.
13. Demonstrate and apply thermal system principles.
14. Demonstrate and apply electrical system principles.
15. Demonstrate and apply mechanical system principles.
16. Communicate through oral, written or graphic means the results of solutions or designs.
17. Demonstrate graphical literacy and use of graphical representations in analysis and design.
18. Describe the legal, ethical, social and economic factors that influence engineering design.
19. Discuss engineering technology careers and practices.
20. Demonstrate the engineering analysis and design methods.
21. Demonstrate the engineering design reporting process as a team effort and individually.
22. Demonstrate and apply mechanical, fluid, electrical and thermal system principles.
23. Demonstrate a knowledge of materials and processes.
24. Use tools, machines, calculators, and computers necessary for obtaining solutions to design problems.
25. Describe the functional characteristics of the engineering design team.
26. Conduct a research and experimentation or design project on engineering technology.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education

SECONDARY NUMBER: 8601300

PROGRAM TITLE: Engineering Technology

COURSE DESCRIPTION:

This course provides students with an introduction to the knowledge, human relations, and technological skills of the engineering profession.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evaluation.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

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04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--
The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
  -integers, fractions, and decimals;
  -ratios, proportions, and percentages;
  -roots and powers;
  -algebra;
  -geometry.
04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry. (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "Brainstorming" as a process to solve problems.

05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--
The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--
The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

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10.04 Identify the risks involved in ownership of a business.
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11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--
The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

12.0 DEMONSTRATE AND APPLY FLUID SYSTEM PRINCIPLES--
The student will be able to:

12.01 Assemble, operate, and identify the parts of a system which demonstrates fluid system principles.
12.02 Demonstrate and apply principles of force, work, rate, resistance, energy, power, and force transformers relating to fluid systems.

13.0 DEMONSTRATE AND APPLY THERMAL SYSTEM PRINCIPLES--
The student will be able to:

13.01 Assemble, operate, and identify the parts of a system which demonstrates thermal system principles.
13.02 Demonstrate and apply principles of force, work, rate, resistance, energy, power, and force transformers relating to thermal systems.

14.0 DEMONSTRATE AND APPLY ELECTRICAL SYSTEM PRINCIPLES--
The student will be able to:

14.01 Assemble, operate, and identify the parts of a system which demonstrates electrical system principles.
14.02 Demonstrate and apply principles of force, work, rate, resistance, energy, power, and force transformers relating to electrical systems.

15.0 DEMONSTRATE AND APPLY MECHANICAL SYSTEM PRINCIPLES--
The student will be able to:

15.01 Assemble, operate, and identify the parts of a system which demonstrates mechanical systems principles.
15.02 Demonstrate and apply principles of force, work, rate, resistance, energy, power, and force transformers relating to mechanical systems.

16.0 COMMUNICATE THROUGH ORAL, WRITTEN OR GRAPHIC MEANS THE RESULTS OF SOLUTIONS OR DESIGNS--
The student will be able to:

16.01 Understand and interpret basic engineering drawings.
16.02 Measure quantities and conduct basic tests according to published procedures.
16.03 Use precision measuring tools and instruments to layout, measure and inspect parts or articles.
16.04 Sketch objects using multi-view and pictorial principles.
16.05 Prepare drawings using basic technical drawing instruments for orthographic and isometric projections.
16.06 Use engineering design graphics and descriptive geometry in the solution of design problems.
16.07 Describe graphic communications principles.

17.0 DEMONSTRATE GRAPHICAL LITERACY AND THE USE OF GRAPHICAL REPRESENTATIONS IN ANALYSIS AND DESIGN--
The student will be able to:

17.01 Identify the basic tools and instruments for engineering design graphics.

17.02 Express knowledge and basic theory in engineering design graphics.
17.03 Make a technological decision related to engineering design graphics.
17.04 Interpret engineering design graphics, using various systems of measurement.
17.05 Define and outline steps in the engineering design graphics process.
17.06 Describe the use of sketches and assembly drawings in the engineering design process.
17.07 Use engineering design graphics to describe the solution of an engineering problem.

18.0 DESCRIBE THE LEGAL, SOCIAL, ETHICAL, AND ECONOMIC FACTORS THAT INFLUENCE ENGINEERING DESIGN--
The student will be able to:

18.01 Discuss the legal constraints placed on the practice of engineering.
18.02 Discuss the underlying principles of professional ethics.
18.03 Discuss the underlying principles of business (i.e., industrial) ethics.
18.04 Describe how economics and resource availability can influence design.
18.05 Explain the need and use of design standards.
18.06 Describe the legal protection afforded an inventor or designer.

19.0 DISCUSS ENGINEERING TECHNOLOGY CAREERS AND PRACTICES--
The student will be able to:

19.01 Summarize the professional characteristics of engineers.
19.02 List the principal fields for specialization in engineering.
19.03 Describe the procedures for becoming a registered engineer in Florida.
19.04 Describe the procedures for becoming a certified engineering technician.
19.05 Outline the typical steps to follow to prepare for a course of study leading to an engineering career.

20.0 DEMONSTRATE ENGINEERING ANALYSIS AND DESIGN METHODS--
The student will be able to:

20.01 Define the terms: analysis, design, and application.
20.02 Define the experimental method as it is applied to design.
20.03 Describe methodology.
20.04 Describe simulation.
20.05 Prepare a model of a design solution to an engineering problem.
20.06 Prepare a graphical solution to an engineering problem.
20.07 Prepare a mathematical solution to an engineering problem (using either a calculator or computer).

21.0 DEMONSTRATE THE ENGINEERING DESIGN REPORTING PROCESS AS A TEAM EFFORT
The student will be able to:

21.01 Research an engineering achievement and prepare a model, or display.
21.02 Deliver a short oral briefing which explains a technical device, process or achievement.
21.03 As a team, present a technical report on an engineering design problem, concept or issue.

22.0 DEMONSTRATE AND APPLY MECHANICAL, FLUID, ELECTRICAL AND THERMAL SYSTEM PRINCIPLES--
The student will be able to:

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22.01 Demonstrate the design solution to a mechanical system problem.
22.02 Demonstrate the design solution to a fluid system problem.
22.03 Demonstrate the design solution to an electrical system problem.
22.04 Demonstrate the design solution to a thermal system problem.
22.05 Select materials and processes to satisfy specific design criteria.
22.06 Select a problem or product for improvement using the design methodology.

23.0 DEMONSTRATE A KNOWLEDGE OF MATERIALS AND PROCESSES--
The student will be able to:

23.01 Describe the physical and chemical properties of engineering materials in terms of their structure.
23.02 List the causes of failure in materials and give procedures to prevent such failure.
23.03 Experiment with processes used with metal, woods, polymers, composite materials and adhesives.

24.0 USE TOOLS, MACHINES, CALCULATORS, AND COMPUTERS NECESSARY FOR OBTAINING SOLUTIONS TO DESIGN PROBLEMS--
The student will be able to:

24.01 Demonstrate the use of various graphs to categorize and display data.
24.02 Make decisions using graphical data presentations.
24.03 Demonstrate the use of a nomograph in solving equations.
24.04 Use a numerical calculator to solve complex equations either by direct solution or iteration (trial and error).
24.05 Use a computer and applications software to solve a design problem by simulation.
24.06 Demonstrate graphical vector analysis.

25.0 DESCRIBE THE FUNCTIONAL CHARACTERISTICS OF THE ENGINEERING DESIGN TEAM
The student will be able to:

25.01 Describe work breakdown organization.
25.02 Describe work group organization schemes including functional and hierarchical schemes.
25.03 Describe the function of management in general and project management in particular.
25.04 Describe a typical design project team structure.
25.05 Outline a research methodology.
25.06 Describe brain-storming.

26.0 CONDUCT A RESEARCH AND EXPERIMENTATION OR DESIGN PROJECT ON ENGINEERING TECHNOLOGY--
The student will be able to:

26.01 Identify a problem.
26.02 State a need to solve the problem.
26.03 Form a hypothesis about the problem.
26.04 Plan the procedures for solving the problem.
26.05 Complete the solution following the planned procedures.
26.06 Present the findings in a seminar.
26.07 State conclusions based on the findings.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education COURSE CREDIT: 1

PROGRAM TITLE: Engineering Technology PROGRAM NUMBER: 8601300

COURSE TITLE: Engineering Technology I COURSE NUMBER: 8601310

COURSE DESCRIPTION:

This course provides students with an introduction to the knowledge, human relations, and technical skills of engineering technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
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03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.

03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--
The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
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04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
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04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
  -integers, fractions, and decimals;
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04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.

05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "Brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--
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06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
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06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--
The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
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07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
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09.0 DEMONSTRATE EMPLOYABILITY SKILLS--
The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
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09.04 Complete a job application form correctly.
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09.06 Prepare a resume for a job.

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The student will be able to:

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10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.

10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--
The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

12.0 DEMONSTRATE AND APPLY FLUID SYSTEM PRINCIPLES--
The student will be able to:

12.01 Assemble, operate, and identify the parts of a system which demonstrates fluid system principles.
12.02 Demonstrate and apply principles of force, work, rate, resistance, energy, power, and force transformers relating to fluid systems.

13.0 DEMONSTRATE AND APPLY THERMAL SYSTEM PRINCIPLES--
The student will be able to:

13.01 Assemble, operate, and identify the parts of a system which demonstrates thermal system principles.
13.02 Demonstrate and apply principles of force, work, rate, resistance, energy, power, and force transformers relating to thermal systems.

14.0 DEMONSTRATE AND APPLY ELECTRICAL SYSTEM PRINCIPLES--
The student will be able to:

14.01 Assemble, operate, and identify the parts of a system which demonstrates electrical system principles.
14.02 Demonstrate and apply principles of force, work, rate, resistance, energy, power, and force transformers relating to electrical systems.

15.0 DEMONSTRATE AND APPLY MECHANICAL SYSTEM PRINCIPLES--
The student will be able to:

15.01 Assemble, operate, and identify the parts of a system which demonstrates mechanical systems principles.
15.02 Demonstrate and apply principles of force, work, rate, resistance, energy, power, and force transformers relating to mechanical systems.

16.0 COMMUNICATE THROUGH ORAL, WRITTEN OR GRAPHIC MEANS THE RESULTS OF SOLUTIONS OR DESIGNS--
The student will be able to:

16.01 Understand and interpret basic engineering drawings.
16.02 Measure quantities and conduct basic tests according to published procedures.
16.03 Use precision measuring tools and instruments to layout, measure and inspect parts or articles.
16.04 Sketch objects using multi-view and pictorial principles.
16.05 Prepare drawings using basic technical drawing instruments for orthographic and isometric projections.
16.06 Use engineering design graphics and descriptive geometry in the solution of design problems.
16.07 Describe graphic communications principles.

17.0 DEMONSTRATE GRAPHICAL LITERACY AND THE USE OF GRAPHICAL REPRESENTATIONS IN ANALYSIS AND DESIGN--
The student will be able to:

17.01 Identify the basic tools and instruments for engineering design graphics.
17.02 Express knowledge and basic theory in engineering design graphics.
17.03 Make a technological decision related to engineering design graphics.
17.04 Interpret engineering design graphics, using various systems of measurement.
17.05 Define and outline steps in the engineering design graphics process.
17.06 Describe the use of sketches and assembly drawings in the engineering design process.
17.07 Use engineering design graphics to describe the solution of an engineering problem.

18.0 DESCRIBE THE LEGAL, SOCIAL, ETHICAL, AND ECONOMIC FACTORS THAT INFLUENCE ENGINEERING DESIGN--
The student will be able to:

18.01 Discuss the legal constraints placed on the practice of engineering.
18.02 Discuss the underlying principles of professional ethics.
18.03 Discuss the underlying principles of business (i.e., industrial) ethics.
18.04 Describe how economics and resource availability can influence design.
18.05 Explain the need and use of design standards.
18.06 Describe the legal protection afforded an inventor or designer.

STUDENT PERFORMANCE STANDARDS		EFFECTIVE DATE:	July, 1993
PROGRAM AREA:	Technology Education	COURSE CREDIT:	1
PROGRAM TITLE:	Engineering Technology	PROGRAM NUMBER:	8601300
COURSE TITLE:	Engineering Technology II	COURSE NUMBER:	8601320

COURSE DESCRIPTION:

This course provides students with an expanded study and application of the knowledge, human relations, and technological skills of engineering technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.

03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--
The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
-integers, fractions, and decimals;
-ratios, proportions, and percentages;
-roots and powers;
-algebra;
-geometry.
04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry. (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.

05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "Brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--
The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--
The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--
The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--
The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.

10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--
The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

19.0 DISCUSS ENGINEERING TECHNOLOGY CAREERS AND PRACTICES--
The student will be able to:

19.01 Summarize the professional characteristics of engineers.
19.02 List the principal fields for specialization in engineering.
19.03 Describe the procedures for becoming a registered engineer in Florida.
19.04 Describe the procedures for becoming a certified engineering technician.
19.05 Outline the typical steps to follow to prepare for a course of study leading to an engineering career.

20.0 DEMONSTRATE ENGINEERING ANALYSIS AND DESIGN METHODS--
The student will be able to:

20.01 Define the terms: analysis, design, and application.
20.02 Define the experimental method as it is applied to design.
20.03 Describe methodology.
20.04 Describe simulation.
20.05 Prepare a model of a design solution to an engineering problem.
20.06 Prepare a graphical solution to an engineering problem.
20.07 Prepare a mathematical solution to an engineering problem (using either a calculator or computer).

21.0 DEMONSTRATE THE ENGINEERING DESIGN REPORTING PROCESS AS A TEAM EFFORT
The student will be able to:

21.01 Research an engineering achievement and prepare a model, or display.
21.02 Deliver a short oral briefing which explains a technical device, process or achievement.
21.03 As a team, present a technical report on an engineering design problem, concept or issue.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993
PROGRAM AREA: Technology Education COURSE CREDIT: 1
PROGRAM TITLE: Engineering Technology PROGRAM NUMBER: 8601300

COURSE TITLE: Engineering Technology III COURSE NUMBER: 8601330

COURSE DESCRIPTION:

This course provides students with an advanced study and application of the knowledge, human relations, and technological skills of engineering technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.

03.05 Comprehend and communicate information relevant to emerging technologies.

03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--
The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.

04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.

04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.

04.04 Distinguish fact from opinion.

04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.

04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.

04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.

04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.

04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.

04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.

04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.

04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.

04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.

04.14 Use the mathematics of:
-integers, fractions, and decimals;
-ratios, proportions, and percentages;
-roots and powers;
-algebra;
-geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.

04.16 Use elementary concepts of probability and statistics.

04.17 Draw, read, and analyze graphs, charts, and tables.

04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.

04.19 Organize and communicate the results obtained by observation and experimentation.

04.20 Apply the basic principles of biology, physics, and chemistry. (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).

04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.

05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "Brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--

The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--

The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--

The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--

The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--

The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.

10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--
The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

22.0 DEMONSTRATE AND APPLY MECHANICAL, FLUID, ELECTRICAL AND THERMAL SYSTEM PRINCIPLES--
The student will be able to:

22.01 Demonstrate the design solution to a mechanical system problem.
22.02 Demonstrate the design solution to a fluid system problem.
22.03 Demonstrate the design solution to an electrical system problem.
22.04 Demonstrate the design solution to a thermal system problem.
22.05 Select materials and processes to satisfy specific design criteria.
22.06 Select a problem or product for improvement using the design methodology.

23.0 DEMONSTRATE A KNOWLEDGE OF MATERIALS AND PROCESSES--
The student will be able to:

23.01 Describe the physical and chemical properties of engineering materials in terms of their structure.
23.02 List the causes of failure in materials and give procedures to prevent such failure.
23.03 Experiment with processes used with metal, woods, polymers, composite materials and adhesives.

24.0 USE TOOLS, MACHINES, CALCULATORS, AND COMPUTERS NECESSARY FOR OBTAINING SOLUTIONS TO DESIGN PROBLEMS--
The student will be able to:

24.01 Demonstrate the use of various graphs to categorize and display data.
24.02 Make decisions using graphical data presentations.
24.03 Demonstrate the use of a nomograph in solving equations.
24.04 Use a numerical calculator to solve complex equations either by direct solution or iteration (trial and error).
24.05 Use a computer and applications software to solve a design problem by simulation.
24.06 Demonstrate graphical vector analysis.

25.0 DESCRIBE THE FUNCTIONAL CHARACTERISTICS OF THE ENGINEERING DESIGN TEAM
The student will be able to:

25.01 Describe work breakdown organization.
25.02 Describe work group organization schemes including functional and hierarchical schemes.
25.03 Describe the function of management in general and project management in particular.
25.04 Describe a typical design project team structure.
25.05 Outline a research methodology.
25.06 Describe brain-storming.

26.0 CONDUCT A RESEARCH AND EXPERIMENTATION OR DESIGN PROJECT ON ENGINEERING TECHNOLOGY--
The student will be able to:

26.01 Identify a problem.
26.02 State a need to solve the problem.
26.03 Form a hypothesis about the problem.
26.04 Plan the procedures for solving the problem.
26.05 Complete the solution following the planned procedures.
26.06 Present the findings in a seminar.
26.07 State conclusions based on the findings.

CURRICULUM FRAMEWORK PROGRAM AREA: Technology Education

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Production Technology

CODE NUMBER: Secondary 8601400 Postsecondary ______

Florida CIP 0821.010900

SECONDARY POSTSECONDARY
ADULT
SCHOOL CREDITS _3_ COLLEGE CREDITS ____ VOCATIONAL CREDITS

APPLICABLE LEVEL(S): ____ 7-9 _X_ 9-12 ____ Postsecondary Adult Vocational

_____ Postsecondary Vocational X Other 30, 31

CERTIFICATION COVERAGE: I ART-TEC 1 @2 INDUS ARTS @4 @6

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to provide students with a foundation of knowledge and experiences in the study of production technology systems.

The content includes, but is not limited to, a study of the tools, materials, processes, and skills relating to materials and processes, manufacturing, and construction technologies. The content and activities will also include the study of occupations, entrepreneurship, safety, and leadership skills.

Listed below are the courses that make up this program. Proposed design code 243 as shown in DVACE joint Memorandum 92-37 of May 27, 1992, is appropriate for this program.

8601410	Production Technology I
8601420	Production Technology II
8601430	Production Technology III

II. LABORATORY ACTIVITIES: Instruction and learning activities are provided in a laboratory setting using hands-on experiences with the tools and materials appropriate to the course content.

III. SPECIAL NOTE: The Florida Technology Student Association (FL-TSA) is the appropriate vocational student organization for providing leadership training experiences and for reinforcing specific technology skills. When provided, these activities are considered an integral part of this instructional program.

The Level II and Level III courses in this program may articulate into postsecondary Tech-Prep 2 + 2 programs when taken in sequence. Tech-Prep 2 + 2 programs require articulation agreements between secondary and postsecondary educational agencies.

A proposed change to section 232.2467 F.S., Florida Gold Seal Vocational Endorsement would permit a student who "completed three credits in a sequential program of studies defined in an articulation agreement with a postsecondary institution(s) and leading to completion of a job preparatory program as defined by section 228.041 F.S." to be included. This would permit Technology Education students to participate in the Florida Gold Seal Vocational Endorsement.

IV. INTENDED OUTCOMES: After successfully completing this program, the student will be able to:

01. Demonstrate the ability to work safely with a variety of technologies.
02. Demonstrate interpersonal skills as they relate to the workplace.
03. Identify and apply methods of information acquisition and utilization.
04. Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.
05. Demonstrate and apply design/problem-solving processes.
06. Express an understanding of technological systems and their complex interrelationships.
07. Demonstrate the ability to properly identify, organize, plan, and allocate reources.
08. Discuss individual interests and aptitudes as they relate to a career.
09. Demonstrate employability skills.
10. Demonstrate an understanding of entrepreneurship.
11. Make an informed and meaningful career choice.
12. Identify kinds and levels of work common to production technology.
13. List requisites and career opportunities for employment in production technology.
14. Describe the processes related to industrial materials and composites.
15. Perform preprocessing skills as it relates to industrial materials and composites.
16. Produce a custom product from industrial materials and composites using preprocessing, processing, and postprocessing production technology skills.
17. Plan and participate in a mass production system for manufacturing a product.
18. Perform the technological processes of separating and forming materials.
19. Utilize modern production technology in the processes of separating, forming, combining, fabrication and finishing of materials (CAM, CNC, Robotics, Work Cells).
20. Demonstrate technological knowledge and skills in the designing and engineering of constructed works.
21. Demonstrate technical knowledge and skills in the contracting, estimating, bidding, and scheduling procedures processes.
22. Demonstrate technical knowledge and skill in the construction of superstructures.
23. Demonstrate technical knowledge and skills in the installation of utilities.
24. Demonstrate technical knowledge and skills in the processes of enclosing superstructures.
25. Demonstrate technical knowledge and skills in the process of finishing the interior and exterior of a constructed structure.
26. Conduct a research and experimentation project on a production technology system.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education SECONDARY NUMBER: 8601400

PROGRAM TITLE: Production Technology

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
  -integers, fractions, and decimals;
  -ratios, proportions, and percentages;
  -roots and powers;
  -algebra;
  -geometry.
04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry. (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "Brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--
The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--
The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--
The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--
The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--
The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.

11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

12.0 IDENTIFY KINDS AND LEVELS OF WORK COMMON TO PRODUCTION TECHNOLOGY--
The student will be able to:

12.01 Identify kinds of work related to materials and processes technologies.
12.02 Identify kinds of work related to manufacturing technologies.
12.03 Identify kinds of work related to construction technologies.
12.04 Identify semiskilled, skilled and professional levels of work in materials and processes technologies.
12.05 Identify semiskilled, skilled, and professional levels of work in manufacturing technologies.
12.06 Identify semiskilled, skilled, and professional levels of work in construction technologies.

13.0 LIST REQUISITES AND CAREER OPPORTUNITIES FOR EMPLOYMENT IN PRODUCTION TECHNOLOGY--
The student will be able to:

13.01 List occupations, job requirements, and employment opportunities in materials and processes, manufacturing construction technology.
13.02 List occupational training programs and academic programs at the postsecondary levels in production technology.

14.0 DESCRIBE THE PROCESSES RELATED TO INDUSTRIAL MATERIALS AND COMPOSITES--
The student will be able to:

14.01 Describe preprocessing functions.
14.02 Describe processing functions.
14.03 Describe postprocessing functions.

15.0 PERFORM PREPROCESSING SKILLS AS IT RELATES TO INDUSTRIAL MATERIALS AND COMPOSITES--
The student will be able to:

15.01 Design a product.
15.02 Prepare a product materials list.
15.03 Prepare a product production procedure list.
15.04 Locate and order products and materials.
15.05 Store and protect product materials properly.

16.0 PRODUCE A CUSTOM PRODUCT FROM INDUSTRIAL MATERIALS AND COMPOSITES USING PREPROCESSING, PROCESSING, AND POSTPROCESSING PRODUCTION TECHNOLOGY SKILLS--
The student will be able to:

16.01 Apply the technology processes of separating and forming materials.
16.02 Apply the technology processes of conditioning materials.
16.03 Apply the technology processes of combining in the fabrication and finishing of materials.
16.04 Apply modern production technology practices and equipment in the processes of separating, forming, conditioning, fabricating and finishing of materials (CNC, CAD, CAM, Robotics, etc.).
16.05 Assemble a product.

17.0 PLAN AND PARTICIPATE IN A MASS PRODUCTION SYSTEM FOR MANUFACTURING A PRODUCT--
The student will be able to:

17.01 Design jigs, fixtures, or a model system for product mass production.

17.02 Develop workable jigs, fixtures and/or a model system for product mass production.
17.03 Participate in the organized mass production of a product.

18.0 PERFORM THE TECHNOLOGICAL PROCESSES OF SEPARATING AND FORMING MATERIALS--
The student will be able to:

18.01 Perform materials forming practices such as casting or molding, and compressing or stretching.
18.02 Perform materials separating practices such as shearing, chip removing, and other separating processes.

19.0 UTILIZE MODERN PRODUCTION TECHNOLOGY IN THE PROCESSES OF SEPARATING, FORMING, COMBINING, FABRICATION, AND FINISHING OF MATERIALS (CAM, CNC, Robotics, Work Cells)--
The student will be able to:

19.01 Design a program to be used in the separating forming and finishing of materials.
19.02 Develop and perform an operational program of forming materials.
19.03 Develop and perform an operational program of finishing materials.
19.04 Develop and perform an operational program that will use a combination of production processes and materials.

20.0 DEMONSTRATE TECHNOLOGICAL KNOWLEDGE AND SKILLS IN THE DESIGNING AND ENGINEERING OF CONSTRUCTED WORKS--
The student will be able to:

20.01 Read and interpret architectural drawings, blueprints, symbols, and construction plans.
20.02 Describe building codes, permits, and inspection requirements.
20.03 Sketch and draw a plan for a construction project.
20.04 Display knowledge about regional planning and the construction of civil and community projects (roads, parks, dams, airports, seaports, warehouses, shopping centers, factories, skyscrapers,etc.).
20.05 Develop a scale model of a civil or community structure and give a report on the need.

21.0 DEMONSTRATE TECHNICAL KNOWEDGE AND SKILLS IN THE CONTRACTING, ESTIMATING, BIDDING, AND SCHEDULING PROCEDURES PROCESSES--
The student will be able to:

21.01 Estimate construction costs using various methods including a computer.
21.02 Read and prepare bid invitations for contractors to build a construction project.
21.03 Establish criteria for awarding a construction contract.
21.04 Describe the content of a construction contract and performance bond.

22.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN THE CONSTRUCTION OF SUPERSTRUCTURES--
The student will be able to:

22.01 Describe mass, solid wall, frame, and air-supported superstructures.
22.02 Describe the materials used in the construction of superstructures.
22.03 Use technical carpentry skills, tools, and materials in constructing a wood frame superstructure.
22.04 Describe factory manufacturing of superstructures and modules.

23.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN THE INSTALLATION OF UTILITIES--
The student will be able to:

23.01 Describe public utility systems for supplying water, electricity, natural gas, and sewerage.
23.02 Describe the functions and operation of heating, cooling, and ventilating systems.
23.03 Demonstrate a technical knowledge of plumbing and electrical systems in homes or buildings.
23.04 Use the technical tools and skills to install plumbing and electrical systems in homes or buildings.
23.05 Diagnose and troubleshoot problems with utility systems.

24.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN THE PROCESS OF ENCLOSING SUPERSTRUCTURES--
The student will be able to:

24.01 Describe the different types of materials and methods of constructing interior and exterior walls.
24.02 Describe the different types of materials and methods of laying floors and building roofs.
24.03 Describe the different types of methods for constructing or installing windows and doors.

24.04 Describe the purposes, materials, and methods for insulating enclosed superstructures.

25.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN THE PROCESS OF FINISHING THE INTERIOR AND EXTERIOR OF A CONSTRUCTED STRUCTURE--
The student will be able to:

25.01 Describe the different types of materials and methods for trimming, painting, and decorating a constructed structure.
25.02 Describe the types of accessories and fixtures that are installed to finish completed construction.
25.03 Describe the materials and methods used for the finishing processes of paving and landscaping.

26.0 CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT ON A PRODUCTION TECHNOLOGY SYSTEM--
The student will be able to:

26.01 Identify a problem.
26.02 State a need to research the problem.
26.03 Form a hypothesis about the problem.
26.04 Plan the procedures for researching the problem.
26.05 Conduct the research following the planned procedures.
26.06 Present the research findings in a seminar.
26.07 State conclusions based on the research findings.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education COURSE CREDIT: 1
PROGRAM NUMBER: 8601400
COURSE NUMBER: 8601410

PROGRAM TITLE: Production Technology

COURSE TITLE: Production Technology I

COURSE DESCRIPTION:

This course provides students with an introduction to the knowledge, human relations, and technical skills of production technology systems.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.

03.06 Demonstrate the use of computers to process information.

04.0 **APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES**--
The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
    -integers, fractions, and decimals;
    -ratios, proportions, and percentages;
    -roots and powers;
    -algebra;
    -geometry.
04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry. (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 **DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES**--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.

05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "Brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--
The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--
The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--
The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--
The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--
The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

12.0 IDENTIFY KINDS AND LEVELS OF WORK COMMON TO PRODUCTION TECHNOLOGY--
The student will be able to:

12.01 Identify kinds of work related to materials and processes technologies.
12.02 Identify kinds of work related to manufacturing technologies.
12.03 Identify kinds of work related to construction technologies.
12.04 Identify semiskilled, skilled and professional levels of work in materials and processes technologies.
12.05 Identify semiskilled, skilled, and professional levels of work in manufacturing technologies.
12.06 Identify semiskilled, skilled, and professional levels of work in construction technologies.

13.0 LIST REQUISITES AND CAREER OPPORTUNITIES FOR EMPLOYMENT IN PRODUCTION TECHNOLOGY--
The student will be able to:

13.01 List occupations, job requirements, and employment opportunities in materials and processes, manufacturing construction technology.
13.02 List occupational training programs and academic programs at the postsecondary levels in production technology.

14.0 DESCRIBE THE PROCESSES RELATED TO INDUSTRIAL MATERIALS AND COMPOSITES--
The student will be able to:

14.01 Describe preprocessing functions.
14.02 Describe processing functions.
14.03 Describe postprocessing functions.

15.0 PERFORM PREPROCESSING SKILLS AS IT RELATES TO INDUSTRIAL MATERIALS AND COMPOSITES--
The student will be able to:

15.01 Design a product.
15.02 Prepare a product materials list.
15.03 Prepare a product production procedure list.
15.04 Locate and order products and materials.
15.05 Store and protect product materials properly.

16.0 PRODUCE A CUSTOM PRODUCT FROM INDUSTRIAL MATERIALS AND COMPOSITES USING PREPROCESSING, PROCESSING, AND POSTPROCESSING PRODUCTION TECHNOLOGY SKILLS--
The student will be able to:

16.01 Apply the technology processes of separating and forming materials.
16.02 Apply the technology processes of conditioning materials.
16.03 Apply the technology processes of combining in the fabrication and finishing of materials.
16.04 Apply modern production technology practices and equipment in the processes of separating, forming, conditioning, fabricating and finishing of materials (CNC, CAD, CAM, Robotics, etc.).
16.05 Assemble a product.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

COURSE CREDIT: 1
PROGRAM AREA: Technology Education PROGRAM NUMBER: 8601400

COURSE NUMBER: 8601420

PROGRAM TITLE: Production Technology

COURSE TITLE: Production Technology II

COURSE DESCRIPTION:

This course provides the student with an expanded study and application of the knowledge, human relations, and technical skills of production technology systems.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.

03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
  -integers, fractions, and decimals;
  -ratios, proportions, and percentages;
  -roots and powers;
  -algebra;
  -geometry.
04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry. (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "Brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--
The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--
The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--
The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--
The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.

10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--
The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

17.0 PLAN AND PARTICIPATE IN A MASS PRODUCTION SYSTEM FOR MANUFACTURING A PRODUCT--
The student will be able to:

17.01 Design jigs, fixtures, or a model system for product mass production.
17.02 Develop workable jigs, fixtures and/or a model system for product mass production.
17.03 Participate in the organized mass production of a product.

18.0 PERFORM THE TECHNOLOGICAL PROCESSES OF SEPARATING AND FORMING MATERIALS--
The student will be able to:

18.01 Perform materials forming practices such as casting or molding, and compressing or stretching.
18.02 Perform materials separating practices such as shearing, chip removing, and other separating processes.

19.0 UTILIZE MODERN PRODUCTION TECHNOLOGY IN THE PROCESSES OF SEPARATING, FORMING, COMBINING, FABRICATION, AND FINISHING OF MATERIALS (CAM, CNC, Robotics, Work Cells)--
The student will be able to:

19.01 Design a program to be used in the separating forming and finishing of materials.
19.02 Develop and perform an operational program of forming materials.
19.03 Develop and perform an operational program of finishing materials.
19.04 Develop and perform an operational program that will use a combination of production processes and materials.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July, 1993

COURSE CREDIT: 1

PROGRAM AREA: Technology Education

SECONDARY NUMBER: 8601400
COURSE NUMBER: 8601430

PROGRAM TITLE: Production Technology

COURSE TITLE: Production Technology III

COURSE DESCRIPTION:

This course provides students with an advanced study and application of the knowledge, human relations, and technical skills of production technology systems.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.

03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
  -integers, fractions, and decimals;
  -ratios, proportions, and percentages;
  -roots and powers;
  -algebra;
  -geometry.
04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry. (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "Brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--
The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--
The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--
The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--
The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.

10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--
The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

20.0 DEMONSTRATE TECHNOLOGICAL KNOWLEDGE AND SKILLS IN THE DESIGNING AND ENGINEERING OF CONSTRUCTED WORKS--
The student will be able to:

20.01 Read and interpret architectural drawings, blueprints, symbols, and construction plans.
20.02 Describe building codes, permits, and inspection requirements.
20.03 Sketch and draw a plan for a construction project.
20.04 Display knowledge about regional planning and the construction of civil and community projects (roads, parks, dams, airports, seaports, warehouses, shopping centers, factories, skyscrapers,etc.).
20.05 Develop a scale model of a civil or community structure and give a report on the need.

21.0 DEMONSTRATE TECHNICAL KNOWEDGE AND SKILLS IN THE CONTRACTING, ESTIMATING, BIDDING, AND SCHEDULING PROCEDURES PROCESSES--
The student will be able to:

21.01 Estimate construction costs using various methods including a computer.
21.02 Read and prepare bid invitations for contractors to build a construction project.
21.03 Establish criteria for awarding a construction contract.
21.04 Describe the content of a construction contract and performance bond.

22.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN THE CONSTRUCTION OF SUPERSTRUCTURES--
The student will be able to:

22.01 Describe mass, solid wall, frame, and air-supported superstructures.
22.02 Describe the materials used in the construction of superstructures.
22.03 Use technical carpentry skills, tools, and materials in constructing a wood frame superstructure.
22.04 Describe factory manufacturing of superstructures and modules.

23.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN THE INSTALLATION OF UTILITIES--
The student will be able to:

23.01 Describe public utility systems for supplying water, electricity, natural gas, and sewerage.
23.02 Describe the functions and operation of heating, cooling, and ventilating systems.
23.03 Demonstrate a technical knowledge of plumbing and electrical systems in homes or buildings.

23.04 Use the technical tools and skills to install plumbing and electrical systems in homes or buildings.
23.05 Diagnose and troubleshoot problems with utility systems.

24.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN THE PROCESS OF ENCLOSING SUPERSTRUCTURES--
The student will be able to:

24.01 Describe the different types of materials and methods of constructing interior and exterior walls.
24.02 Describe the different types of materials and methods of laying floors and building roofs.
24.03 Describe the different types of methods for constructing or installing windows and doors.
24.04 Describe the purposes, materials, and methods for insulating enclosed superstructures.

25.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN THE PROCESS OF FINISHING THE INTERIOR AND EXTERIOR OF A CONSTRUCTED STRUCTURE--
The student will be able to:

25.01 Describe the different types of materials and methods for trimming, painting, and decorating a constructed structure.
25.02 Describe the types of accessories and fixtures that are installed to finish completed construction.
25.03 Describe the materials and methods used for the finishing processes of paving and landscaping.

26.0 CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT ON A PRODUCTION TECHNOLOGY SYSTEM--
The student will be able to:

26.01 Identify a problem.
26.02 State a need to research the problem.
26.03 Form a hypothesis about the problem.
26.04 Plan the procedures for researching the problem.
26.05 Conduct the research following the planned procedures.
26.06 Present the research findings in a seminar.
26.07 State conclusions based on the research findings.

CURRICULUM FRAMEWORK PROGRAM AREA: Technology Education

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

COURSE TITLE: Technology Studies

CODE NUMBER: Secondary 8601500 Postsecondary __________

Florida CIP 0821.010100

SECONDARY SCHOOL CREDITS 3 COLLEGE CREDITS __________ POSTSECONDARY ADULT VOCATIONAL CREDITS __________

APPLICABLE LEVEL(S): _____ 7-9 X 9-12 _____ Postsecondary Adult Vocational

_____ Postsecondary Vocational X Other 30, 31

CERTIFICATION COVERAGE: I ART-TEC 1 @2 INDUS ARTS @4 @6

I. MAJOR CONCEPTS/CONTENT: The purpose of this course is to introduce students to technology, elements of technology, technological systems, physical technologies, information/communication technologies, biotechnologies and issues and outlooks in technology.

Laboratory experiences revolve around the physical technologies of construction, energy and power, manufacturing, material processing and transportation; information/communication technologies of information processing, graphic communication and electronic communication; and biotechnologies in agriculture, health care and medicine.

The content includes, but is not limited to, the study of design/problem-solving processes, systems of technology, computer applications, careers, special skills, safety, human relationships, leadership, free enterprise system, entrepreneurship and evolving technologies.

Listed below are the courses that make up this program. Proposed design code 243 as shown in DVACE joint Memorandum 92-37 of May 27, 1992, is appropriate for this program.

8601510	Technology Studies I
8601520	Technology Studies II
8601530	Technology Studies III

II. LABORATORY ACTIVITIES: Instruction and learning activities are provided in a laboratory setting using hands-on experiences with technology related to the content.

III. SPECIAL NOTE: The Florida Technology Student Association (FL-TSA) is the appropriate student organization for providing leadership training experiences and for reinforcing specific vocational skills. When provided, these activities are considered a part of this instructional course.

The Level II and Level III courses in this program may articulate into postsecondary Tech-Prep 2 + 2 programs when taken in sequence. Tech-Prep 2 + 2 programs require articulation agreements between secondary and postsecondary educational agencies.

A proposed change to section 232.2467 F.S., Florida Gold Seal Vocational Endorsement would permit a student who "completed three credits in a sequential program of studies defined in an articulation agreement with a postsecondary institution(s) and leading to completion of a job preparatory program as defined by section 228.041 F.S." to be included. This would permit Technology Education students to participate in the Florida Gold Seal Vocational Endorsement.

IV. INTENDED OUTCOMES: After successfully completing this course, the student will be able to:

01. Demonstrate the ability to work safely with a variety of technologies.
02. Demonstrate interpersonal skills as they relate to the workplace.
03. Identify and apply methods of information acquisition and utilization.
04. Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.
05. Demonstrate and apply design/problem-solving processes.
06. Express an understanding of technological systems and their complex interrelationships.
07. Demonstrate the ability to properly identify, organize, plan, and allocate reources.
08. Discuss individual interests and aptitudes as they relate to a career.
09. Demonstrate employability skills.
10. Demonstrate an understanding of entrepreneurship.
11. Make an informed and meaningful career choice.
12. Identify evolving technologies in our technological world.
13. Demonstrate knowledge of the basic principles of technology, the basic elements of all systems, and the components of each basic element.
14. Demonstrate knowledge and perform special skills unique to the physical technologies.
15. Demonstrate knowledge and perform special skills unique to the information/communication technologies.
16. Demonstrate knowledge and perform special skills unique to the biotechnologies.
17. Demonstrate knowledge and application of robotics technology.
18. Demonstrate knowledge and application of programmable controller technology.
19. Demonstrate the techniques of computer numerical control technology.
20. Demonstrate knowledge and application of computer-aided drafting technology.
21. Demonstrate knowledge and application of laser technology.
22. Demonstrate knowledge and application of mechanical systems.
23. Demonstrate knowledge and application of fluid systems.
24. Demonstrate knowledge and application of electrical systems.
25. Demonstrate the use of fiber optics.
26. Demonstrate the use of a computer to integrate and control a system composed of mechanical, fluid and electrical systems.
27. Conduct a research and experimentation project on a technological material or process.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July,1993

PROGRAM AREA: Technology Studies SECONDARY NUMBER: 8601500

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.

04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
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04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
  -integers, fractions, and decimals;
  -ratios, proportions, and percentages;
  -roots and powers;
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04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry. (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "Brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--
The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--
The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:
08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--
The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--
The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--
The student will be able to:

11.01 Review tentative occupational choices based on the information learned and interest developed in this course.
11.02 Describe individual strengths and weaknesses.
11.03 Discuss individual interests related to a career.
11.04 Identify careers within specific technologies.
11.05 Explore careers within a specific technology.

11.06 Make a tentative occupational choice based on the information learned and interest developed in this course.

12.0 IDENTIFY EVOLVING TECHNOLOGIES IN OUR TECHNOLOGICAL WORLD--
The student will be able to:

12.01 List five technologies that did not exist five years ago.
12.02 Use the problem-solving process to generate three potential improvements to a recent, or evolving technology.

13.0 DEMONSTRATE KNOWLEDGE OF THE BASIC PRINCIPLES OF TECHNOLOGY, THE BASIC ELEMENTS OF ALL SYSTEMS, AND THE COMPONENTS OF EACH BASIC ELEMENT--
The student will be able to:

13.01 Define the six basic principles of technology: force, work, rate, resistance, energy, and power.
13.02 Name and define the three basic elements of all systems.
13.03 Name components of the three basic elements of a system.
13.04 Name the six basic parts of the energy system.
13.05 State the function of each of the basic parts of the energy system.
13.06 Name and explain the functions of the four common working energy systems: mechanical, electrical, fluid, and thermal.

14.0 DEMONSTRATE KNOWLEDGE AND PERFORM SPECIAL SKILLS UNIQUE TO THE PHYSICAL TECHNOLOGIES--
The student will be able to:

14.01 Define the function of construction technology, energy and power technology, manufacturing technology, and transportation technology.
14.02 Describe three careers for each of the physical technologies identified in 14.01.
14.03 Identify and demonstrate the tools, processes, and materials used in construction technology.
14.04 Identify and demonstrate the equipment, processes, and materials used in energy and power technology for converting and transmitting power.
14.05 Identify and demonstrate the tools, processes, and materials used in manufacturing technology to perform computer-aided manufacturing.
14.06 Identify and demonstrate various ways that people and goods are transported.
14.07 Demonstrate problem-solving skills relative to the physical technologies utilizing the techniques learned in this course.

15.0 DEMONSTRATE KNOWLEDGE AND PERFORM SPECIAL SKILLS UNIQUE TO THE INFORMATION/COMMUNICATION TECHNOLOGIES--
The student will be able to:

15.01 Define the function of information processing technology, graphic communication technology, and electronic communication technology.
15.02 Describe three careers for each of the communications technologies identified in 15.01.
15.03 Identify and demonstrate the tools, processes and materials used in the information/communication technologies.
15.04 Compare and contrast different processes of communication technologies.
15.05 Demonstrate modern communication systems using sound and speech, symbols and codes, printed words, drawing and pictures.
15.06 Identify the function of information processing technology, graphic communication technology, and electronic communication technology.
15.07 Identify several telecommunication services.

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15.08 Demonstrate problem-solving skills relative to the information communication technologies utilizing the techniques learned in this course.

16.0 DEMONSTRATE KNOWLEDGE AND PERFORM SPECIAL SKILLS UNIQUE TO THE BIOTECHNOLOGIES--

The student will be able to:

16.01 Define the function of biotechnology, medical technology, food production technology, and agriculture technology.
16.02 Describe three careers for each of the technology areas in 16.01.
16.03 Explain the three areas into which modern biotechnology is divided.
16.04 Contrast the seven resources for biotechnology with other technologies.
16.05 Identify several impacts of biotechnology on society and the environment.
16.06 Identify the role of biotechnology in agriculture, food production, and medicine.
16.07 Identify and describe the processes used in biotechnology and the related areas of produce outputs.
16.08 Identify several outputs of biotechnology and their related biotechnologies.
16.09 Demonstrate problem solving skills relative to biotechnology, or a related biotechnology utilizing the techniques learned in this course.

17.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF ROBOTICS TECHNOLOGY--

The student will be able to:

17.01 Identify three types of robots.
17.02 State the function of effectors, sensors, controllers, and auxiliary parts in a robotic system.
17.03 Operate a robot using a teach pendant.
17.04 Program a robot using a computer to perform a specific task.
17.05 Explain three impacts of robotics on society.
17.06 Demonstrate problem-solving skills relative to robotics utilizing the techniques learned in this course.

18.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF PROGRAMMABLE CONTROLLER TECHNOLOGY--

The student will be able to:

18.01 State the function of the component parts of a programmable controller.
18.02 List several advantages of using programmable controllers.
18.03 Demonstrate logical continuity and branching functions with a programmable controller.

19.0 DEMONSTRATE THE TECHNIQUE OF COMPUTER NUMERICAL CONTROL TECHNOLOGY--

The student will be able to:

19.01 Demonstrate the technique of computer numerical control to perform an engraving and a milling activity.
19.02 Demonstrate problem-solving skills relative to computer numerical control utilizing the techniques learned in this course.

20.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF COMPUTER-AIDED DRAFTING TECHNOLOGY --

The student will be able to:

20.01 Compare and contrast computer-aided drafting with non-computer-aided drafting in terms of speed consistency, neatness, and accuracy.
20.02 Demonstrate the application of a computer and software program in doing several computer aided drawings.
20.03 Identify computer-aided drafting hardware.
20.04 Demonstrate program-solving skills relative to computer aided drafting utilizing the techniques learned in this course.

21.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF LASER TECHNOLOGY--
The student will be able to:

21.01 Describe five applications of lasers.
21.02 Perform laser experiments demonstrating knowledge of:
  .01 Characteristics of laser light.
  .02 Characteristics of light waves.
21.03 List the safety precautions that one observes when working with a laser.
21.04 Assemble, operate and identify the parts of a laser optics system.
21.05 Demonstrate the use of a laser to do measurements, transmit data, and monitor.

22.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF MECHANICAL SYSTEMS--
The student will be able to:

22.01 Define the concepts of force, work, rate, resistance, energy and power as they relate to mechanical systems.
22.02 Diagram a mechanical system incorporating input, monitoring, controlling, output, and feedback.
22.03 Report on the six simple machines.
22.04 Identify various parts of a mechanical system.
22.05 Assemble and operate the six simple machines.
22.06 Use the problem-solving model--perform activities using combinations of the six simple machines to meet the described design criteria.
22.07 Demonstrate the use of a computer to control a mechanical system.

23.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF FLUID SYSTEMS--
The student will be able to:

23.01 Define the concepts of force, work, rate, resistance, energy and power as they relate to fluid systems.
23.02 Diagram a fluid system incorporating input, monitoring, controlling, output, and feedback.
23.03 Diagram a fluid power system incorporating input, monitoring, controlling, output, and feedback.
23.04 Use the problem-solving model--perform activities using fluid power components to meet the described design criteria.
23.05 Assemble, operate, and identify the parts of a fluid power system.
23.06 Report on the applications of fluid power used in technology.
23.07 Demonstrate the use of a computer to control a fluid power system.

24.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF ELECTRICAL SYSTEMS--
The student will be able to:

24.01 Define the concepts of force, work, rate resistance, energy, and power as they relate to electrical systems.
24.02 Diagram an electrical system incorporating input, monitoring, controlling, output and feedback components.
24.03 Explain what a system and sub-system is.
24.04 Describe types of electrical outputs of heat, light, temperature, sound, magnetism, and electrical voltage.
24.05 Describe types of electrical inputs of light, temperature, sound, magnetism, moisture, movement, pressure, and voltage.

24.06 Use the problem-solving model--perform activities using electrical system components to meet the described design criteria.
24.07 Demonstrate the use of a computer to control an electrical system.

25.0 DEMONSTRATE THE USE OF FIBER OPTICS--
The student will be able to:

25.01 Report on the applications of fiber optics in technology.
25.02 Use the problem-solving model--perform activities using fiber optics to meet the described design criteria.
25.03 Assemble, operate, and identify the parts of a fiber optics systems.

26.0 DEMONSTRATE THE USE OF A COMPUTER TO INTEGRATE AND CONTROL A SYSTEM COMPOSED OF MECHANICAL, FLUID AND ELECTRICAL SYSTEMS--
The student will be able to:

26.01 Diagram an integrated system incorporating input, monitoring, controlling, output and feedback components.
26.02 Use the problem-solving model--perform activities using integrated systems to meet the described design criteria.
26.03 Assemble, operate, and identify the parts of integrated systems.
26.04 Demonstrate the use of a computer to control an integrated system composed of mechanical, fluid and electrical components.

27.0 CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT ON A TECHNOLOGICAL MATERIAL OR PROCESS--
The student will be able to:

27.01 Identify a problem.
27.02 State a need to research the problem.
27.03 Form a hypothesis about the problem.
27.04 Plan the procedures for researching the problem.
27.05 Conduct the research following the planned procedures.
27.06 Present the research findings in a seminar.
27.07 State conclusions based on the research findings.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993
PROGRAM AREA: Technology Education COURSE CREDIT: 1

PROGRAM TITLE: Technology Studies PROGRAM NUMBER: 8601500

COURSE TITLE: Technology Studies I COURSE NUMBER: 8601510

COURSE DESCRIPTION:

This course provides students with an expanded study and application of the knowledge, human relations, and technical skills of Technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--
The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
  -integers, fractions, and decimals;
  -ratios, proportions, and percentages;
  -roots and powers;
  -algebra;
  -geometry.
04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry. (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "Brainstorming" as a process to solve problems.

05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--
The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--
The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:
08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--
The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--
The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--
The student will be able to:

11.01 Review tentative occupational choices based on the information learned and interest developed in this course.
11.02 Describe individual strengths and weaknesses.
11.03 Discuss individual interests related to a career.
11.04 Identify careers within specific technologies.
11.05 Explore careers within a specific technology.
11.06 Make a tentative occupational choice based on the information learned and interest developed in this course.

12.0 IDENTIFY EVOLVING TECHNOLOGIES IN OUR TECHNOLOGICAL WORLD--
The student will be able to:

12.01 List five technologies that did not exist five years ago.
12.02 Use the problem-solving process to generate three potential improvements to a recent, or evolving technology.

13.0 DEMONSTRATE KNOWLEDGE OF THE BASIC PRINCIPLES OF TECHNOLOGY, THE BASIC ELEMENTS OF ALL SYSTEMS, AND THE COMPONENTS OF EACH BASIC ELEMENT--
The student will be able to:

13.01 Define the six basic principles of technology: force, work, rate, resistance, energy, and power.
13.02 Name and define the three basic elements of all systems.
13.03 Name components of the three basic elements of a system.
13.04 Name the six basic parts of the energy system.
13.05 State the function of each of the basic parts of the energy system.
13.06 Name and explain the functions of the four common working energy systems: mechanical, electrical, fluid, and thermal.

14.0 DEMONSTRATE KNOWLEDGE AND PERFORM SPECIAL SKILLS UNIQUE TO THE PHYSICAL TECHNOLOGIES--
The student will be able to:
14.01 Define the function of construction technology, energy and power technology, manufacturing technology, and transportation technology.
14.02 Describe three careers for each of the physical technologies identified in 14.01.
14.03 Identify and demonstrate the tools, processes, and materials used in construction technology.
14.04 Identify and demonstrate the equipment, processes, and materials used in energy and power technology for converting and transmitting power.
14.05 Identify and demonstrate the tools, processes, and materials used in manufacturing technology to perform computer-aided manufacturing.
14.06 Identify and demonstrate various ways that people and goods are transported.
14.07 Demonstrate problem-solving skills relative to the physical technologies utilizing the techniques learned in this course.

15.0 DEMONSTRATE KNOWLEDGE AND PERFORM SPECIAL SKILLS UNIQUE TO THE INFORMATION/COMMUNICATION TECHNOLOGIES--
The student will be able to:

15.01 Define the function of information processing technology, graphic communication technology, and electronic communication technology.
15.02 Describe three careers for each of the communications technologies identified in 15.01.
15.03 Identify and demonstrate the tools, processes and materials used in the information/communication technologies.
15.04 Compare and contrast different processes of communication technologies.

15.05 Demonstrate modern communication systems using sound and speech, symbols and codes, printed words, drawing and pictures.
15.06 Identify the function of information processing technology, graphic communication technology, and electronic communication technology.
15.07 Identify several telecommunication services.
15.08 Demonstrate problem-solving skills relative to the information communication technologies utilizing the techniques learned in this course.

16.0 DEMONSTRATE KNOWLEDGE AND PERFORM SPECIAL SKILLS UNIQUE TO THE BIOTECHNOLOGIES--

The student will be able to:

16.01 Define the function of biotechnology, medical technology, food production technology, and agriculture technology.
16.02 Describe three careers for each of the technology areas in 16.01.
16.03 Explain the three areas into which modern biotechnology is divided.
16.04 Contrast the seven resources for biotechnology with other technologies.
16.05 Identify several impacts of biotechnology on society and the environment.
16.06 Identify the role of biotechnology in agriculture, food production, and medicine.
16.07 Identify and describe the processes used in biotechnology and the related areas of produce outputs.
16.08 Identify several outputs of biotechnology and their related biotechnologies.
16.09 Demonstrate problem solving skills relative to biotechnology, or a related biotechnology utilizing the techniques learned in this course.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education COURSE CREDIT: 1

PROGRAM TITLE: Technology Studies PROGRAM NUMBER: 8601500

COURSE TITLE: Technology Studies II COURSE NUMBER: 8601520

COURSE DESCRIPTION:

This course provides students with an expanded study and application of the knowledge, human relations, and technical skills of Technology.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--
The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--
The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--
The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

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04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--

The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
  -integers, fractions, and decimals;
  -ratios, proportions, and percentages;
  -roots and powers;
  -algebra;
  -geometry.
04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry. (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--

The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "Brainstorming" as a process to solve problems.

05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--
The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--
The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:
08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--
The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--
The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--
The student will be able to:

11.01 Review tentative occupational choices based on the information learned and interest developed in this course.
11.02 Describe individual strengths and weaknesses.
11.03 Discuss individual interests related to a career.
11.04 Identify careers within specific technologies.
11.05 Explore careers within a specific technology.
11.06 Make a tentative occupational choice based on the information learned and interest developed in this course.

17.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF ROBOTICS TECHNOLOGY--
The student will be able to:

17.01 Identify three types of robots.
17.02 State the function of effectors, sensors, controllers, and auxiliary parts in a robotic system.
17.03 Operate a robot using a teach pendant.
17.04 Program a robot using a computer to perform a specific task.
17.05 Explain three impacts of robotics on society.
17.06 Demonstrate problem-solving skills relative to robotics utilizing the techniques learned in this course.

18.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF PROGRAMMABLE CONTROLLER TECHNOLOGY--
The student will be able to:

18.01 State the function of the component parts of a programmable controller.
18.02 List several advantages of using programmable controllers.
18.03 Demonstrate logical continuity and branching functions with a programmable controller.

19.0 DEMONSTRATE THE TECHNIQUE OF COMPUTER NUMERICAL CONTROL TECHNOLOGY--
The student will be able to:

19.01 Demonstrate the technique of computer numerical control to perform an engraving and a milling activity.
19.02 Demonstrate problem-solving skills relative to computer numerical control utilizing the techniques learned in this course.

20.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF COMPUTER-AIDED DRAFTING TECHNOLOGY --
The student will be able to:

20.01 Compare and contrast computer-aided drafting with non-computer-aided drafting in terms of speed consistency, neatness, and accuracy.
20.02 Demonstrate the application of a computer and software program in doing several computer aided drawings.
20.03 Identify computer-aided drafting hardware.
20.04 Demonstrate program-solving skills relative to computer aided drafting utilizing the techniques learned in this course.

21.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF LASER TECHNOLOGY--
The student will be able to:

21.01 Describe five applications of lasers.
21.02 Perform laser experiments demonstrating knowledge of:
    .01 Characteristics of laser light.
    .02 Characteristics of light waves.
21.03 List the safety precautions that one observes when working with a laser.
21.04 Assemble, operate and identify the parts of a laser optics system.
21.05 Demonstrate the use of a laser to do measurements, transmit data, and monitor.

PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education COURSE CREDIT: 1

PROGRAM TITLE: General Studies in Technology PROGRAM NUMBER: 8601500

COURSE TITLE: Technology Studies III COURSE NUMBER: 8601530

COURSE DESCRIPTION:

This course provides students with an expanded study and application of the knowledge, human relations, and technical skills of Technology.

01.0 DEMONSTRATE PROPER AND SAFE PROCEDURES WHILE WORKING WITH TECHNOLOGICAL TOOLS, APPARATUS, EQUIPMENT, SYSTEMS, AND MATERIALS--
The student will be able to:

01.01 Follow laboratory safety rules and procedures.
01.02 Demonstrate good housekeeping at work station within total laboratory.
01.03 Conduct laboratory activities and equipment operations in a safe manner.
01.04 Exercise care and respect for all tools, equipment, and materials.
01.05 Identify color-coding safety standards.
01.06 Safely use hand tools and power equipment.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 EXHIBIT POSITIVE HUMAN RELATIONS AND LEADERSHIP SKILLS--
The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Work cooperatively with others.

03.0 DEMONSTRATE COMPUTER APPLICATION AND LITERACY--
The student will be able to:

03.01 Define terms related to computer parts usage.
03.02 List ways in which computers are used in technology.
03.03 Discuss advantages and disadvantages in the use of computers.
03.04 Demonstrate the application of a computer.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--
The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--
The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.
04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.
04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
 -integers, fractions, and decimals;
 -ratios, proportions, and percentages;
 -roots and powers;
 -algebra;
 -geometry.
04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry. (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.
05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "Brainstorming" as a process to solve problems.

05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--
The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--
The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:
08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--
The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--
The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--
The student will be able to:

11.01 Review tentative occupational choices based on the information learned and interest developed in this course.
11.02 Describe individual strengths and weaknesses.
11.03 Discuss individual interests related to a career.
11.04 Identify careers within specific technologies.
11.05 Explore careers within a specific technology.
11.06 Make a tentative occupational choice based on the information learned and interest developed in this course.

22.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF MECHANICAL SYSTEMS--
The student will be able to:

22.01 Define the concepts of force, work, rate, resistance, energy and power as they relate to mechanical systems.
22.02 Diagram a mechanical system incorporating input, monitoring, controlling, output, and feedback.
22.03 Report on the six simple machines.
22.04 Identify various parts of a mechanical system.
22.05 Assemble and operate the six simple machines.
22.06 Use the problem-solving model--perform activities using combinations of the six simple machines to meet the described design criteria.
22.07 Demonstrate the use of a computer to control a mechanical system.

23.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF FLUID SYSTEMS--
The student will be able to:

23.01 Define the concepts of force, work, rate, resistance, energy and power as they relate to fluid systems.
23.02 Diagram a fluid system incorporating input, monitoring, controlling, output, and feedback.
23.03 Diagram a fluid power system incorporating input, monitoring, controlling, output, and feedback.
23.04 Use the problem-solving model--perform activities using fluid power components to meet the described design criteria.
23.05 Assemble, operate, and identify the parts of a fluid power system.
23.06 Report on the applications of fluid power used in technology.
23.07 Demonstrate the use of a computer to control a fluid power system.

24.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF ELECTRICAL SYSTEMS--
The student will be able to:

24.01 Define the concepts of force, work, rate resistance, energy, and power as they relate to electrical systems.
24.02 Diagram an electrical system incorporating input, monitoring, controlling, output and feedback components.
24.03 Explain what a system and sub-system is.
24.04 Describe types of electrical outputs of heat, light, temperature, sound, magnetism, and electrical voltage.
24.05 Describe types of electrical inputs of light, temperature, sound, magnetism, moisture, movement, pressure, and voltage.
24.06 Use the problem-solving model--perform activities using electrical system components to meet the described design criteria.
24.07 Demonstrate the use of a computer to control an electrical system.

25.0 DEMONSTRATE THE USE OF FIBER OPTICS--
The student will be able to:

25.01 Report on the applications of fiber optics in technology.
25.02 Use the problem-solving model--perform activities using fiber optics to meet the described design criteria.
25.03 Assemble, operate, and identify the parts of a fiber optics systems.

26.0 DEMONSTRATE THE USE OF A COMPUTER TO INTEGRATE AND CONTROL A SYSTEM COMPOSED OF MECHANICAL, FLUID AND ELECTRICAL SYSTEMS--
The student will be able to:

26.01 Diagram an integrated system incorporating input, monitoring, controlling, output and feedback components.
26.02 Use the problem-solving model--perform activities using integrated systems to meet the described design criteria.
26.03 Assemble, operate, and identify the parts of integrated systems.
26.04 Demonstrate the use of a computer to control an integrated system composed of mechanical, fluid and electrical components.

27.0 CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT ON A TECHNOLOGICAL MATERIAL OR PROCESS--
The student will be able to:

27.01 Identify a problem.
27.02 State a need to research the problem.
27.03 Form a hypothesis about the problem.
27.04 Plan the procedures for researching the problem.
27.05 Conduct the research following the planned procedures.
27.06 Present the research findings in a seminar.
27.07 State conclusions based on the research findings.

CURRICULUM FRAMEWORK PROGRAM AREA: Technology Education

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Integrated Technology Studies

CODE NUMBER: Secondary 8600000 Postsecondary ________

Florida CIP 0821.0122EX

SECONDARY
SCHOOL CREDITS 0.5 COLLEGE CREDITS _____ POSTSECONDARY ADULT VOCATIONAL CREDITS ___

APPLICABLE LEVEL (S): X 6-9 ___ 9-12 ___ Postsecondary Adult Vocational

___ Postsecondary Vocational ___ Other 30, 31

CERTIFICATION COVERAGE: 1 ART-TEC 1 @2 IND ARTS @4 @6

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to provide students with a foundation of knowledge and technically oriented experiences in the study of the applications of technology and its effect upon our lives and the choosing of an occupation. The content and activities will also include the study of entrepreneurship, safety, and leadership skills.

The emphasis of this program is on developing awareness of future needs, developing technological competence, confidence and awareness through interaction with technologies, developing awareness of other vocational programs, interacting with business, industry and community organizations, applying basic skills in learning activities, and developing self-awareness of individual abilities, needs and interests. The courses are intended to help students develop their problem-solving skills and creativity while learning about technology and careers. Students will learn to gather data through research and testing, as well as to record the results of their laboratory experiments.

The content includes introductory studies in areas of technology which introduce students to the development of abilities to calculate, make important observations, analyze and solve problems using manipulative skills while working cooperatively with others in team activities.

Listed below are the courses that make up this program at the secondary level followed by the proposed laboratory design code appropriate for each course as shown in DVACE joint Memorandum 92-37:

8600010	Introduction to Technology (240)
8600020	Exploring Technology (240)
8600030	Exploration of Communications Technology (240)
8600040	Exploration of Production Technology (240)

II. LABORATORY ACTIVITIES: Instruction and learning activities are provided in a laboratory setting using hands-on experiences with technology equipment, tools and materials appropriate to the course content.

III. SPECIAL NOTE: The Florida Technology Student Association (FL-TSA) is the appropriate vocational student organization for providing leadership training experiences and for reinforcing specific technology skills. When provided, these activities are considered an integral part of this instructional program.

IV. INTENDED OUTCOMES: Outcomes 1 through 8 apply to each of the following courses. After successfully completing a course the student will be able to:

01. Demonstrate proper and safe procedures while working with technological tools, apparatus, equipment, systems, and materials.
02. Exhibit positive human relations and leadership skills.
03. Demonstrate computer application and literacy.
04. Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.
05. Demonstrate and apply design/problem-solving processes.
06. Demonstrate technological literacy.
07. Display an understanding and appreciation for the dignity and worth of honest labor.
08. Discuss individual interests and aptitudes as they relate to a career.

8600010 - INTRODUCTION TO TECHNOLOGY

09. Develop the idea that technology is the application of knowledge to solve human problems and extend capabilities.
10. Describe positive and negative impacts of technology.
11. Identify resources of technology.
12. Utilize the systems approach in technology.
13. Utilize tools, machines, and equipment in the technology laboratory.

8600020 - EXPLORING TECHNOLOGY

14. Identify evolving technologies in our technological world.
15. Perform special skills unique to electronics, computers, and the technology systems of communications manufacturing, construction, energy, power, and transportation.
16. Express a knowledge of the essential elements and organization of the free enterprise system.
17. List requisites and employment opportunities for employment in today's and our future technological world.
18. Identify kinds and levels of work common to today's and our future technological world.

8600030 - EXPLORATION OF COMMUNICATIONS TECHNOLOGY

19. List requisites and career opportunities for employment in the occupations relating to communications technology.
20. Perform special skills unique to communications technology.
21. Express a knowledge of factors that impact on communications technology and practices.

8600040 - EXPLORATION OF PRODUCTION TECHNOLOGY

22. Identify evolving Technologies of Production Systems.
23. Perform special skills unique to Manufacturing Technology.
24. Express a knowledge of factors that impact on Manufacturing Technologies and practices.
25. Perform special skills unique to Construction Technology.
26. Express a knowledge of factors that impact on Construction Technology and practices.
27. Identify kinds and levels of work common to Production Technology.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education PROGRAM NUMBER: 8600000

PROGRAM TITLE: Integrated Technology Studies

COURSE TITLES:
8600010 - Introduction to Technology
8600020 - Exploring Technology
8600030 - Exploration of Communications Technology
8600040 - Exploration of Production Technology

01.0 DEMONSTRATE PROPER AND SAFE PROCEDURES WHILE WORKING WITH TECHNOLOGICAL TOOLS, APPARATUS, EQUIPMENT, SYSTEMS, AND MATERIALS--The student will be able to:

01.01 Follow laboratory safety rules and procedures.
01.02 Demonstrate good housekeeping at work station within total laboratory.
01.03 Conduct laboratory activities and equipment operations in a safe manner.
01.04 Exercise care and respect for all tools, equipment, and materials.
01.05 Identify color-coding safety standards.
01.06 Safely use hand tools and power equipment.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 EXHIBIT POSITIVE HUMAN RELATIONS AND LEADERSHIP SKILLS--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Work cooperatively with others.

03.0 DEMONSTRATE COMPUTER APPLICATION AND LITERACY - The student will be able to:

03.01 Define terms related to computer parts and usage.
03.02 List ways in which computers are used in technology.
03.03 Discuss advantages and disadvantages in the use of computers.
03.04 Demonstrate the application of a computer.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES - The student will be able to:

04.01 Use the features of books and reference materials, such as table of contents, preface, introduction, titles and subtitles, index, glossary, appendix, bibliography.
04.02 Read and follow complex written directions.
04.03 Find, understand, and apply information from a variety of sources (books, manuals, newspapers, periodicals, directories, reference works, computer printouts, and other printed matter or electronic sources such as video display terminals.
04.04 Use and expand general and specialized vocabulary (including abbreviations, acronyms, and concepts) As appropriate to subject areas studied at the grade level.
04.05 Write Standard English sentences with correct:
    -sentence structure;
    -verb forms;
    -punctuation, capitalization, possessives, plural forms, and other matters of mechanics;
    -word choice and spelling.

04.06 Answer and ask questions coherently and concisely, and follow spoken instructions.
04.07 Identify and comprehend the main and subordinate ideas in lectures and discussions, ask questions to clarify information heard, and report accurately what others have said.
04.08 Perform with accuracy the computations of addition, subtraction, multiplication, and division using natural numbers, fractions, decimals and integers.
04.09 Make and use measurements in both traditional and metric units.
04.10 Formulate and solve problems in mathematical terms, selecting appropriate approaches and tools (mental computation, trial and error, paper-and-pencil techniques, calculator, and computer).
04.11 Solve work-related problems involving the basic arithmetic operations using whole numbers, fractions, decimals, and percents.
04.12 Describe the role of observation and experimentation in the development of scientific theories.
04.13 Gather scientific information through skills in laboratory, field and library work.
04.14 Draw conclusions or make inferences from data.
04.15 Apply basic scientific/technical solutions to the appropriate problems.

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.

06.0 DEMONSTRATE TECHNOLOGICAL LITERACY--
The student will be able to:

06.01 Outline major historical technological developments or events.
06.02 Identify recent advances in technology.
06.03 Explain problem-solving roles of technology.
06.04 Forecast a technological development or event.
06.05 Make a technological decision.
06.06 Define technology.

07.0 DISPLAY AN UNDERSTANDING AND APPRECIATION FOR THE DIGNITY AND WORTH OF HONEST LABOR--
The student will be able to:

07.01 Form an understanding and appreciation for work after listening to or observing technology workers.
07.02 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
07.03 Form an understanding and appreciation for the roles and work of co-workers.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

8600010 - INTRODUCTION TO TECHNOLOGY

09.0 DEVELOP THE IDEA THAT TECHNOLOGY IS THE APPLICATION OF KNOWLEDGE TO SOLVE HUMAN PROBLEMS AND EXTEND CAPABILITIES--
The student will be able to:

09.01 Discuss the impacts of technology on work, job opportunities, and careers.
09.02 Discuss the outputs of technology, now and in the future.
09.03 Discuss how technology can solve and/or create problems.
09.04 Discuss expected and unexpected outputs of technology.
09.05 Identify a problem affecting human life in your community and utilize problem-solving skills and teamwork to find a solution.

10.0 DESCRIBE POSITIVE AND NEGATIVE IMPACTS OF TECHNOLOGY--
The student will be able to:

10.01 Explain the term "impact".
10.02 Explain ways in which technology influences/affects his/her life and the environment.
10.03 Categorize impacts as "desirable" or "undesirable".
10.04 Suggest ways of minimizing undesirable impacts and protecting the environment.

11.0 IDENTIFY RESOURCES OF TECHNOLOGY--
The student will be able to:

11.01 Define the term "resource".
11.02 Identify major categories of resources of technology.
11.03 List specific examples of resources of technology.
11.04 Categorize examples of resources of technology.
11.05 Explain how technological development is dependent upon resources.
11.06 Utilize technological resources to produce a product.

12.0 UTILIZE THE SYSTEMS APPROACH IN TECHNOLOGY--
The student will be able to:

12.01 Define the term "system" as used in technology.
12.02 Identify and explain major components of a system.
12.03 Draw and label a basic system model.
12.04 Describe common examples of technological systems.
12.05 Construct and/or operate a simple technological system.

13. UTILIZE TOOLS, MACHINES, AND EQUIPMENT IN THE TECHNOLOGY LABORATORY--
The student will be able to:

13.01 Identify tools, machines, materials and equipment and describe their functions.
13.02 Select appropriate tools, machines, and equipment to accomplish a given task.
13.03 Demonstrate safe and correct use of tools, machines, and equipment.

8600020 - EXPLORING TECHNOLOGY

14.0 IDENTIFY EVOLVING TECHNOLOGIES IN OUR TECHNOLOGICAL WORLD--
The student will be able to:

14.01 List evolving technologies.
14.02 Report on a recent or evolving technology.

15.0 PERFORM SPECIAL SKILLS UNIQUE TO ELECTRONICS, COMPUTERS AND THE TECHNOLOGY SYSTEMS OF COMMUNICATIONS, CONSTRUCTION, MANUFACTURING, ENERGY, POWER, AND TRANSPORTATION--
The student will be able to:

15.01 Perform electronic technology laboratory activities.
    15.01.1 Define Electronic Systems.
    15.01.2 Conduct electronic systems experiments using input, process, and output.

15.02 Perform computer technology laboratory activities.
    15.02.1 Define computer technology.
    15.02.2 Conduct computer controlled experiments.
15.03 Perform special skills unique to communications operations.
    15.03.1 Perform basic drafting skills using traditional tools, instruments, and methods.
    15.03.2 Perform basic drafting skills using today's technology.
15.04 Perform construction technology laboratory activities.
    15.04.1 Perform basic construction skills using traditional tools, equipment and methods.
    15.04.2 Perform basic construction skills using today's technology, tools, equipment, and methods.
15.05 Perform special skills unique to manufacturing technology.
    15.05.1 Perform basic production skills using traditional tools, equipment, and methods.
    15.05.2 Perform basic production skills using today's technology, tools, equipment, and methods (CAD/CAM, CNC, Robots, Work Cell, etc.).
15.06 Perform special skills unique to energy, power, and transportation technology.
    15.06.1 Perform basic energy, power, and transportation skills using traditional tools, equipment and methods.
    15.06.2 Perform basic energy, power, and transportation skills using today's technology, tools, equipment and methods.

16.0 EXPRESS A KNOWLEDGE OF THE ESSENTIAL ELEMENTS AND ORGANIZATION OF THE FREE ENTERPRISE SYSTEM--
The student will be able to:

16.01 Outline the main functions of research and development, personnel management, production, quality control, and marketing.
16.02 Participate in a simulated technology organization incorporating the five above elements.

17.0 LIST REQUISITES AND EMPLOYMENT OPPORTUNITIES FOR EMPLOYMENT IN TODAY'S AND OUR FUTURE TECHNOLOGICAL WORLD--
The student will be able to:

17.01 List occupations, job requirements and employment opportunities in communications technology.
17.02 List occupations, job requirements and employment opportunities in construction technology.
17.03 List occupations, job requirements and employment opportunities in manufacturing technology.
17.04 List occupations, job requirements and employment opportunities in energy, power, and transportation technology.
17.05 List related occupations and academic courses available at the secondary and postsecondary levels.

18.0 IDENTIFY KINDS AND LEVELS OF WORK COMMON TO TECHNOLOGY--
The student will be able to:

18.01 Identify kinds of work as a technology craftsperson.
18.02 Identify kinds of work as a technology technician.
18.03 Identify kinds of work as a technology engineer or scientist.
18.04 Identify kinds of work in technology management.
18.05 Identify other kinds of technology work.

8600030 - EXPLORATION OF COMMUNICATIONS TECHNOLOGY

19.0 LIST REQUISITES AND CAREER OPPORTUNITIES FOR EMPLOYMENT IN COMMUNICATIONS TECHNOLOGY--
The student will be able to:

19.01 List occupations, job requirements, and employment opportunities in graphic communication technology.
19.02 Identify kinds of work related to various communications occupations.
19.03 List occupational training programs and academic programs at the postsecondary levels in graphic communications technologies.
19.04 Express a knowledge of communications technology labor organizations and hiring practices.
19.05 Identify recent advances in technology and evolving technologies in communications.
19.06 Report on a recent evolving technology in communications.

20.0 PERFORM SPECIAL SKILLS UNIQUE TO COMMUNICATIONS TECHNOLOGY--
The student will be able to:

20.01 Identify and use basic drafting tools and instruments for making drawings.
20.02 Explain the processes of relief, gravur, screen process, and lithographic printing; bindery operations; photographic reproduction; and electronic communications.
20.03 Use proper layout and design skills for producing a printed product.
20.04 Produce a product utilizing screen process printing technology and skills.
20.05 Produce a product utilizing lithographic printing technology and skills.
20.06 Produce a print utilizing photographic technology and skills.
20.07 Use bindery skills to produce a book or booklet.
20.08 Apply technical knowledge and skills related to two or more of the following areas of electronic communications: telephone, radio, television, digital data transmission, and satellite communications.

21.0 EXPRESS A KNOWLEDGE OF FACTORS THAT IMPACT ON COMMUNICATIONS TECHNOLOGY AND PRACTICES--
The student will be able to:

21.01 Explain economic factors that impact on graphic communications technology.
21.02 Research and identify styles and types of printed products desired by customers or consumers.
21.03 Identify the natural and synthetic resources required for papers, inks, rollers, and solutions used in graphic communications technology.

8600040 · EXPLORATION OF PRODUCTION TECHNOLOGY

22.0 IDENTIFY EVOLVING TECHNOLOGIES OF PRODUCTIONS SYSTEMS--
The student will be able to:

22.01 Participate in a discussion about evolving technologies of manufacturing systems and construction processes.
22.02 List evolving technologies of manufacturing and construction industries.
22.03 Brainstorm futuristic production systems.

23.0 PERFORM SPECIAL SKILLS UNIQUE TO MANUFACTURING TECHNOLOGY--
The student will be able to:

23.01 Design a product for custom or mass production manufacturing.
23.02 Plan a mass production system for manufacturing a product.
23.03 Perform materials forming practices such as casting or molding, and compressing or stretching.
23.04 Perform materials separating practices such as shearing, chip removing, and other separating processes.
23.05 Perform materials conditioning practices such as heat treating, physical conditioning, or through chemical reactions.
23.06 Combine components through mixing, coating, bonding, and mechanical fastening.
23.07 Assemble a product or a subassembly of a product.

24.0 EXPRESS A KNOWLEDGE OF FACTORS THAT IMPACT ON MANUFACTURING TECHNOLOGY AND PRACTICES--
The student will be able to:

24.01 Explain economic factors that impact on manufacturing technology.
24.02 Research and identify consumer demands for a manufactured product.
24.03 Identify sources of raw materials and/or standard stock materials needed for a manufactured product.
24.04 Interview, hire, train, or promote an applicant or employee for a simulated mass production manufacturing activity.
24.05 Define the terms "organized labor" and "collective bargaining."
24.06 Prepare a plan for marketing and distributing a manufactured product.

25.0 PERFORM SPECIAL SKILLS UNIQUE TO CONSTRUCTION TECHNOLOGY-
The student will be able to:

25.01 Interpret construction plans and blueprints.
25.02 Identify construction materials.
25.03 Apply carpentry skills.
25.04 Apply plumbing skills.
25.05 Apply electrical wiring skills.
25.06 Apply masonry skills.
25.07 Describe or demonstrate the construction skills of plastering, roofing and finishing.

26.0 EXPRESS A KNOWLEDGE OF FACTORS THAT IMPACT ON CONSTRUCTION TECHNOLOGY AND PRACTICES--
The student will be able to:

26.01 Explain economic factors that impact on construction technology.
26.02 Research and identify types and styles of construction desired by consumers.
26.03 List sources of raw materials and standard stock materials available to construction technology.
26.04 Express a knowledge of construction technology labor organizations and hiring practices.

27.0 IDENTIFY KINDS AND LEVELS OF WORK COMMON TO PRODUCTION TECHNOLOGY--
The student will be able to:

27.01 Identify kinds of work related to manufacturing technologies.
27.02 Identify semiskilled, skilled, and professional levels of work in manufacturing construction technology.
27.03 List occupations, job requirements, and employment opportunities in manufacturing technology.
27.04 List occupational training programs and academic programs at the secondary/post secondary levels in manufacturing technologies.

27.05 List occupations, job requirements and employment opportunities in construction technology.

27.06 List occupational training programs and academic programs at the secondary/post secondary levels in construction technologies.

CURRICULUM FRAMEWORK   PROGRAM AREA: Technology Education

FLORIDA DEPARTMENT OF EDUCATION   EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Technology Systems

CODE NUMBER: Secondary 8600400   Postsecondary _______

Florida CIP 0821.0128PA

SECONDARY
SCHOOL CREDITS 0.5   COLLEGE CREDITS ______   POSTSECONDARY ADULT
VOCATIONAL CREDITS _____

APPLICABLE LEVEL(S): _____7-9   X 9-12   ____Postsecondary Adult Vocational

______ Postsecondary Vocational   X__ Other 30, 31

CERTIFICATION COVERAGE: INDUS ARTS @ 4 @ 6
I ART-TEC 1 @ 2

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to provide students with a foundation of knowledge and technically oriented experiences in the study of the applications of technology and its effect upon our lives and the choosing of an occupation. Students will be introduced to the concepts that underlie technological systems and the influence of technological systems at home, school, and the world of work.

Listed below are the courses that make up this program at the secondary level followed by the proposed laboratory design code appropriate for the courses as shown in DVACE joint Memorandum 92-37:

8600410	Communication Systems (242)
8600420	Power and Transportation Systems (242)
8600430	Production Systems (242)
8600440	Drafting and Design (242)
8600450	Electronics Systems (241)
8600460	Engineering Systems (242)
8600470	Applied Technology Systems (242)
8600480	Home Technology Systems (242)

II. LABORATORY ACTIVITIES: Learning activities are provided in a laboratory setting using hands-on experiences with the tools and materials appropriate to the course content.

III. SPECIAL NOTE: The Florida Technology Student Association (FL-TSA) is the appropriate vocational student organization for providing leadership training experiences and for reinforcing specific technology skills. When provided, these activities are considered an integral part of this instructional program.

IV. INTENDED OUTCOMES: Outcomes 1 through 7 apply to each of the courses in this program. After successfully completing a course the student will be able to:

01. Demonstrate the ability to work safely with a variety of Technologies.
02. Demonstrate interpersonal skills as they relate to the workplace.
03. Identify and apply methods of information acquisition andutilizations.
04. Apply basic skills in communications mathematics, and science appropriate to technological content and learning activities.
05. Demonstrate and apply design/problem-solving processes.

06. Express an understanding of technology systems and their complex interrelationships.
07. Demonstrate the ability to properly identify, organize, plan and allocate resources.

8600410 - COMMUNICATIONS SYSTEMS

08. Demonstrate technological literacy about communications systems.
09. Apply communications technology skills.

8600420 - POWER AND TRANSPORTATION SYSTEMS

10. Describe sources of energy.
11. Describe the application of energy to power and transportation systems.
12. Apply technology skills to a selected power or transportation system.

8600430 - PRODUCTION SYSTEMS

13. Demonstrate a knowledge of the production systems found in modern industries.
14. Define the processes related to materials utilized in manufacturing and production.
15. Plan and develop a system to produce a product from available materials.

8600440 - DRAFTING AND DESIGN

16. Demonstrate proper and safe procedures and technical knowledge and skills in the use and care of drafting instruments, materials equipment.
17. Demonstrate technical knowledge skills and applications common to all types of drafting including C.A.D.
18. Demonstrate technical knowledge and skills for making drafting sketches.
19. Demonstrate technical knowledge and skills for making three-view orthographic drawings.
20. Demonstrate technical knowledge and skills for making oblique pictorial drawings.
21. Demonstrate technical knowledge and skills for making isometric pictorial drawings.
22. Demonstrate technical knowledge and skills for making aerodynamic drawings.
23. Demonstrate technical knowledge and skills for making a C.A.D. drawing.
24. Demonstrate technical knowledge and skills for reproducing a C.A.D. drawing on a plotter.

8600450 - ELECTRONICS SYSTEMS

25. Apply electricity/electronics technology skills.
26. Demonstrate technological literacy about electricity/electronics systems.
27. Demonstrate knowledge of the role electronics plays in magnetic, optical, fluid and mechanical control systems.

8600460 - ENGINEERING SYSTEMS

28. Demonstrate the engineering analysis and design methods.
29. Communicate through oral, written or graphic means the results of solutions or designs.
30. Demonstrate and apply mechanical, fluid, electrical and thermal system principles.

31. Demonstrate a knowledge of materials and processes.
32. Use tools, machines, calculators, and computers necessary for obtaining solutions to design problems.
33. Describe the functional characteristics of the engineering design team.

8600470 - APPLIED TECHNOLOGY SYSTEMS

34. Discuss the impact of technology on society and the environment.
35. Demonstrate and apply mechanical system principles.
36. Demonstrate and apply fluid system principles.
37. Demonstrate and apply electrical system principles.
38. Demonstrate and apply thermal system principles.
39. Demonstrate the use of a computer to integrate and control a system composed of mechanical, fluid and electrical systems.
40. Demonstrate the use of sensors to control systems.
41. Demonstrate the use of fiber optics concepts.
42. Demonstrate the use of laser optic concepts.

8600480 - HOME TECHNOLOGY SYSTEMS

43. Identify and list the different systems found in the new homes under construction today.
44. Draw up a bill of materials required to repair a selected component of a unit in a home technology system.
45. Apply home maintenance technology skills to a selected system requiring repair.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education SECONDARY NUMBER: 8600400

PROGRAM TITLE: Technology Systems

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--
The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work state and within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--
The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--
The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evaluation.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--
The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.

04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.

04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.

04.04 Distinguish fact from opinion.

04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.

04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.

04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.

04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.

04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.

04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.

04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.

04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.

04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.

04.14 Use the mathematics of:
- -integers, fractions, and decimals;
- -ratios, proportions, and percentages;
- -roots and powers;
- -algebra;
- -geometry.

04.15 Make estimates and approximations, and judge the reasonableness of a result.

04.16 Use elementary concepts of probability and statistics.

04.17 Draw, read, and analyze graphs, charts, and tables.

04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.

04.19 Organize and communicate the results obtained by observation and experimentation.

04.20 Apply the basic principles of biology, physics, and chemistry. (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).

04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.

05.02 Propose solutions to given problems.

05.03 Design and implement the optimal solution to a given problem.

05.04 Document each step of the design/problem-solving process.

05.05 Demonstrate "Brainstorming" as a process to solve problems.

05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--
The student will be able to:

06.01 Demonstrate a knowledge of how social, orgainzational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--
The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

8600410 - COMMUNICATIONS SYSTEMS

08.0 DEMONSTRATE TECHNOLOGICAL LITERACY ABOUT COMMUNICATIONS SYSTEMS--
The student will be able to:

08.01 Define communications technology.
08.02 Outline major technological developments and events in the history of communications systems technology.
08.03 Identify recent advances in communications technology.
08.04 Forecast a development or event in communications technology.

09.0 APPLY COMMUNICATIONS TECHNOLOGY SKILLS--
The student will be able to:

09.01 Explain the processes of relief, gravure, screen process, and lithographic printing; bindery operations; photographic reproduction; and electronic communications.
09.02 Demonstrate technical knowledge and skills in the preparation of art and copy for printing reproduction.
09.03 Design, lay out, and produce a printed product utilizing the above printing processes.
09.04 Express a knowledge of the basic theory of photography.
09.05 Produce a photographic negative and print utilizing the tools, equipment, materials, and processes of photography.
09.06 Describe the basic characteristics and specifications of paper, ink, and chemicals used in communications technology.
09.07 List ways in which computers are used in communications systems technology.
09.08 Operate a computer utilizing a program related to communications technology.
09.09 Express a technical knowledge and understanding about electronic communications technology, to include telephone, radio, television, digital data transmission, and satellite communications.
09.10 Apply technical knowledge and skills related to one or more of the above areas of electronic communications.

8600420 - POWER AND TRANSPORTATION SYSTEMS

10.0 DESCRIBE SOURCES OF ENERGY--
The student will be able to:

10.01 Describe sources of thermal energy.
10.02 Describe sources of radiant energy.
10.03 Describe sources of nuclear energy.
10.04 Describe sources of chemical energy.
10.05 Describe sources of electrical energy.
10.06 Describe sources of mechanical energy.
10.07 Describe sources of fluid energy.

11.0 DESCRIBE THE APPLICATIONS OF ENERGY TO POWER AND TRANSPORTATION SYSTEMS-
The student will be able to:

11.01 Explain the uses and applications of thermal energy in generating electrical power.
11.02 Discuss how radiant energy is used in our homes.
11.03 Describe energy and fuel sources for internal combustion engines.
11.04 Identify and define key terms, categories and parts of jet engine power systems.
11.05 Identify and explain the uses of hydraulic power in automotive systems.
11.06 List the kinds of exhaustible, renewable, and inexhaustible energy resources.

12.0 APPLY TECHNOLOGICAL KNOWLEDGE AND SKILLS TO A SELECTED POWER OR TRANSPORTATION SYSTEM--
The student will be able to:

12.01 Identify a system.
12.02 Identify an energy source to be used.
12.03 Plan the procedures for designing the system.
12.04 Sketch and present the plan to the class.

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8600430 - PRODUCTION SYSTEMS

13.0 DEMONSTRATE A KNOWLEDGE OF THE PRODUCTION SYSTEMS FOUND IN MODERN INDUSTRIES--
The student will be able to:

13.01 List and describe the three major types of production activities.
13.02 Describe resource processing systems.
13.03 Describe product manufacturing systems.
13.04 Describe structure construction systems.
13.05 Identify recent technological advances in production systems.

14.0 DEFINE THE PROCESSES RELATED TO MATERIALS UTILIZED IN MANUFACTURING AND PRODUCTION--
The student will be able to:

14.01 Define manufacturing.
14.02 List and describe six types of secondary manufacturing processes.
14.03 List ways in which computers are used in the manufacturing and production systems.

15.0 PLAN AND DEVELOP A SYSTEM TO PRODUCE A PRODUCT FROM AVAILABLE MATERIALS-
The student will be able to:

15.01 Sketch, draw and interpret working drawings.
15.02 Use measuring tools and instruments.
15.03 Design and construct one or more individual projects utilizing technical skills and processes of woods, metals and plastics technology.
15.04 Estimate the cost of the job required to produce the project.

15.05 List groups or organizations that represent specialized manufacturing and production skills.

8600440 - DRAFTING AND DESIGN

16.0 DEMONSTRATE PROPER AND SAFE PROCEDURES AND TECHNICAL KNOWLEDGE AND SKILLS IN THE USE AND CARE OF DRAFTING INSTRUMENTS, MATERIALS AND EQUIPMENT--
The student will be able to:

16.01 Identify the basic tools and instruments for drafting.
16.02 Interpret a blueprint, working drawing or other type of dimensional technical illustration.
16.03 Produce a working drawing or technical illustration using drafting tools instruments and skills.

17.0 DEMONSTRATE TECHNICAL KNOWLEDGE, SKILLS AND APPLICATIONS COMMON TO ALL TYPES OF DRAFTING INCLUDING COMPUTER-AIDED DRAFTING (C.A.D.)--
The student will be able to:

17.01 Outline major technological developments in the history of drafting and design tools and equipment.
17.02 Make freehand sketches.
17.03 Produce a drawing using drafting instruments.
17.04 Set up a computer to produce a drawing.

18.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING DRAFTING SKETCHES-
The student will be able to:

18.01 Illustrate a technical idea by means of a sketch.

19.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING ORTHOGRAPHIC DRAWINGS--
The student will be able to:

19.01 Explain the theory of orthographic projections.
19.02 Identify the six principal views of an object.
19.03 Produce a three-view orthographic drawing.

20.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING OBLIQUE PICTORIAL DRAWINGS--
The student will be able to:

20.01 Define types of pictorial drawings.
20.02 Produce an oblique pictorial drawing.

21.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING ISOMETRIC PICTORIAL DRAWINGS--
The student will be able to:

21.01 Discuss the isometric drawing procedures.
21.02 Produce an isometric pictorial drawing.

22.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING AERODYNAMIC DRAWINGS--
The student will be able to:

22.01 Discuss aerodynamic designs of aircraft and automobiles.
22.02 Produce an aerodynamic scale drawing.

23.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR MAKING A COMPUTER-AIDED DRAWING (C.A.D.)--
The student will be able to:

23.01 List the major components of a computer-aided drafting system and their functions.
23.02 Demonstrate technical knowledge and skills in setting up a C.A.D. system.

24.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS FOR REPRODUCING A COMPUTER-AIDED DRAWING ON A PLOTTER--
The student will be able to:

24.01 Produce a computer-aided drawing which can be displayed by means of a computer.

8600450 - ELECTRONICS SYSTEMS

25.0 APPLY ELECTRICITY/ELECTRONICS TECHNOLOGY SKILLS--
The student will be able to:

25.01 Identify and use the basic tools used in electricity/electronics.
25.02 Identify and use the basic instruments used in electricity/electronics.
25.03 Interpret electricity/electronics wiring diagrams and schematics.
25.04 Identify electricity/electronics components.
25.05 Explain the use of electricity/electronics components.
25.06 Explain the difference between electricity and electronics.
25.07 Describe and construct the following electricity circuits: switch controlled lampholder, three-way switch, four-way switch, splitwired receptacle, door buzzers, thermostat, timer, dimmer, photocell, and fluorescent lamp.

26.0 DEMONSTRATE TECHNOLOGICAL LITERACY ABOUT ELECTRICITY/ELECTRONICS SYSTEMS--
The student will be able to:

26.01 Outline major technological developments and events in the history of electricity/electronics.
26.02 Identify recent advances in electricity/electronics.
26.03 Explain the problem-solving roles of electricity/electronics.
26.04 Forecast a development or event in electricity/electronics technology.
26.05 Make a technical decision related to electricity/electronics.
26.06 Define electricity/electronics technology.
26.07 Define solid state, analog and digital systems.
26.08 Explain the basic components of electrical/electronics systems.

27.0 DEMONSTRATE KNOWLEDGE OF THE ROLE ELECTRONICS PLAYS IN MAGNETIC, OPTICAL, FLUID AND MECHANICAL CONTROL SYSTEMS--
The student will be able to:

27.01 Identify examples of each type of control system.
27.02 Explain the role electronics plays in systems feedback giving examples of everyday use.
27.03 Identify by brainstorming new possible applications of control systems to satisfy a need or extend human capabilities.

8600460 - ENGINEERING SYSTEMS

28.0 DEMONSTRATE ENGINEERING ANALYSIS AND DESIGN METHODS--
The student will be to:

28.01 Define the terms: analysis, design, and applications.
28.02 Define the experimental method as it is applied to design.
28.03 Describe a design methodology.
28.04 Describe simulation.
28.05 Prepare a model of a design solution to an engineering problem.

28.06 Prepare a graphical solution to an engineering problem.
28.07 Prepare a mathematical solution to an engineering problem (using either a calculator or computer).

29.0 COMMUNICATE THROUGH ORAL WRITTEN, OR GRAPHIC MEANS, THE RESULTS OF SOLUTIONS OR DESIGNS--
The student will be able to:

29.01 Understand and interpret basic engineering drawings.
29.02 Measure quantities and conduct basic tests according to published procedures.
29.03 Use precision measuring tools and instruments to layout, measure and inspect parts or articles.
29.04 Sketch objects using multi-view and pictorial principles.
29.05 Prepare drawings using basic technical drawing instruments for orthographic and isometric projections.
29.06 Use engineering design graphics and descriptive geometry in the solution of design problems.
29.07 Describe graphic communications principles.

30.0 DEMONSTRATE AND APPLY MECHANICAL, FLUID, ELECTRICAL AND THERMAL SYSTEM PRINCIPLES--
The student will be able to:

30.01 Assemble, operate, and identify the parts of a system which demonstrates mechanical systems principles.
30.02 Assemble, operate, and identify the parts of a system which demonstrates fluid system principles.
30.03 Assemble, operate, and identify the parts of a system which demonstrates electrical system principles.
30.04 Assemble, operate, and identify the parts of a system which demonstrates thermal system principles.

31.0 DEMONSTRATE A KNOWLEDGE OF MATERIALS AND PROCESSES--
The student will be able to:

31.01 Describe the physical and chemical properties of engineering materials in terms of their structure.
31.02 List the causes of failure in materials and give procedures to prevent such failure.
31.03 Experiment with processes used with metal, woods, polymers, composite materials and adhesives.

32.0 USE TOOLS, MACHINES, CALCULATORS, AND COMPUTERS NECESSARY FOR OBTAINING SOLUTIONS TO DESIGN PROBLEMS--
The student will be able to:

32.01 Demonstrate the use of various graphs to categorize and display data.
32.02 Make decisions using graphical data presentations.
32.03 Demonstrate the use of a nomograph in solving equations.
32.04 Use a numerical calculator to solve complex equations either by direct solution or iteration (trial and error).
32.05 Use a computer and applications software to solve a design problem by simulation.
32.06 Demonstrate graphical vector analysis.

33.0 DESCRIBE THE FUNCTIONAL CHARACTERISTICS OF THE ENGINEERING DESIGN TEAM--
The student will be able to:

33.01 Describe work breakdown organization.
33.02 Describe work group organization schemes including functional and hierarchical schemes.

33.03 Describe the function of management in general and project management in particular.
33.04 Describe a typical design project team structure.
33.05 Outline a research methodology.
33.06 Describe brain-storming.

8600470 - APPLIED TECHNOLOGY SYSTEMS

34.0 DISCUSS THE IMPACT OF TECHNOLOGY ON SOCIETY AND THE ENVIRONMENT--
The student will be able to:

34.01 Discuss the impact of technology, now and in the future.
34.02 Discuss the impacts of technology on work, job opportunities and careers.
34.03 Identify the scope of technological impacts.
34.04 Identify means of controlling the world impacts of technology.
34.06 Discuss expected and unexpected impacts of technology.
34.07 Discuss desired and undesired impacts of technology.
34.08 Prepare a report on the impact of technology.

35.0 DEMONSTRATE AND APPLY MECHANICAL SYSTEM PRINCIPLES--
The student will be able to:

35.01 Assemble, operate, and identify the parts of a system which demonstrates mechanical system principles.
35.02 Demonstrate and apply principles of force, work, rate, resistance, energy, power, and force transformers relating to mechanical systems.

36.0 DEMONSTRATE AND APPLY FLUID SYSTEM PRINCIPLES--
The student will be able to:

36.01 Assemble, operate and identify the parts of a system which demonstrates fluid system principles.
36.02 Demonstrate and apply principle of force, work, rate, resistance, energy, power, and force transformers, relating to fluid systems.

37.0 DEMONSTRATE AND APPLY ELECTRICAL SYSTEM PRINCIPLES--
The student will be able to:

37.01 Assemble, operate, and identify the parts of a system which demonstrates electrical system principles.
37.02 Demonstrate and apply principles of force, work, rate, resistance, energy, power, and force transformers relating to electrical systems.

38.0 DEMONSTRATE AND APPLY THERMAL SYSTEM PRINCIPLES--
The student will be able to:

38.01 Assemble, operate, and identify the parts of a system which demonstrates thermal system principles.
38.02 Demonstrate and apply principles of force, work, rate, resistance, energy, power, and force transformers relating to thermal systems.

39.0 DEMONSTRATE THE USE OF A COMPUTER TO INTEGRATE AND CONTROL A SYSTEM COMPOSED OF MECHANICAL, FLUID AND ELECTRICAL SYSTEMS--
The student will be able to:

39.01 Diagram an integrated system incorporating input, monitoring, controlling, output and feedback components.
39.02 Perform experiments using mechanical, fluid and electrical components in an integrated system.
39.03 Assemble, operate and identify the parts of computer controlled mechanical, fluid, and electrical systems.

40.0 DEMONSTRATE THE USE OF SENSORS TO CONTROL SYSTEMS--
The student will be able to:

40.01 Perform experiments using electronic sensors.
40.02 Assemble, operate and identify the types of sensors used in technology.
40.03 Write a report on the applications of sensors use in technology.

41.0 DEMONSTRATE THE USE OF FIBER OPTICS CONCEPTS--
The student will be able to:

41.01 Write a report on the application of fiber optics used in technology.
41.02 Perform fiber optics experiments.
41.03 Assemble, operate and identify the parts of a fiber optics system.

42.0 DEMONSTRATE THE USE OF LASER OPTICS CONCEPTS--
The student will be able to:

42.01 Write a report on the applications of laser optics used in technology.
42.02 Perform laser optics experiments.
42.03 Assemble, operate and identify the parts of a laser optics system.

8600480 - HOME TECHNOLOGY SYSTEMS

43.0 IDENTIFY AND LIST THE DIFFERENT SYSTEMS FOUND IN NEW HOMES UNDER CONSTRUCTION TODAY--
The student will be able to:

43.01 Identify systems used and install in home construction.
43.02 Develop a schedule of routine home system preventative maintenance.
43.03 Identify recent advances in home maintenance technology.

44.0 DRAW UP A BILL OF MATERIALS REQUIRED TO REPAIR A SELECTED COMPONENT IN A HOME TECHNOLOGY SYSTEM--
The student will be able to:

44.01 Identify a system component requiring repair.
44.02 Identify the problem and parts required to make repairs.
44.03 Estimate the cost of repair.

45.0 APPLY HOME MAINTENANCE TECHNOLOGY SKILLS TO A SELECTED SYSTEM REQUIRING REPAIR--
The student will be able to:

45.01 Identify and assemble the tools required to perform the repair.
45.02 Demonstrate a knowledge of problem-solving approaches to handle home maintenance needs.
45.03 Demonstrate consumer technical knowledge about home maintenance tools, materials and equipment.
45.04 List ways in which a personal computer may be used for home maintenance purposes.

CURRICULUM FRAMEWORK PROGRAM AREA: Technology Education

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Technology Applications I

CODE NUMBER: Secondary 8600500 Postsecondary ______

Florida CIP 0321.011100

SECONDARY
SCHOOL CREDITS ___ COLLEGE CREDITS ___ POSTSECONDARY ADULT
VOCATIONAL CREDITS ___

APPLICABLE LEVEL(S): ___ 7-9 X 9-12 ___ Postsecondary Adult Vocational

___ Postsecondary Vocational X Other 30, 31

CERTIFICATION COVERAGE: INDUS ARTS @ 4 @ 6
I ART-TEC 1 @2

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to provide students with a foundation of knowledge and technically oriented experiences in the study of the applications of technology and its effect upon our lives and the choosing of an occupation. The content and activities will also include the study of entrepreneurship, safety, and leadership skills.

The courses include basic level I content in Technology Studies, Production Technology and Engineering Technology. The Level II and III courses in these curriculum areas are found in TECHNOLOGY APPLICATIONS II and TECHNOLOGY APPLICATIONS III. It should be noted that articulation agreements between secondary and postsecondary institutions may permit one or more different Technology Education courses to be selected in sequence and given credit toward Diploma or Associate Degree studies at the postsecondary levels depending upon student goals and the articulation agreements.

Listed below are the level I courses which are the initial courses in the Technology Applications I thru III sequence offered at secondary schools followed by the proposed laboratory design codes appropriate for the courses as shown in DVACE joint Memorandum 92-37.

8600510	Technology Studies I (243)
8600540	Production Technology I (243)
8600570	Engineering Technology I (243)

II. LABORATORY ACTIVITIES: Instruction and learning activities are provided in a laboratory setting using hands-on experiences with technology equipment, tools and materials appropriate to the course content.

III. SPECIAL NOTE: The Florida Technology Student Association (FL-TSA) is the appropriate vocational student organization for providing leadership training experiences and for reinforcing specific technology skills. When provided, these activities are considered an integral part of this instructional program.

A proposed change to section 239.217 F.S., Florida Gold Seal Vocational Endorsement, would permit a student who "completed three credits in a sequential program of studies defined in an articulation agreement with a postsecondary institution(s) and leading to completion of a postsecondary job preparatory program as defined by 228.041 F.S." to participate in the Gold Seal Vocational Endorsement.

IV. INTENDED OUTCOMES: Outcomes 1 through 11 apply to each of the courses in this program. After successfully completing this course the student will be able to:

01. Demonstrate the ability to work safely with a variety of technologies.
02. Demonstrate interpersonal skills as they relate to the workplace.
03. Identify and apply methods of information acquisition and utilization.
04. Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.
05. Demonstrate and apply design/problem-solving processes.
06. Express an understanding of technological systems and their complex interrelationships.
07. Demonstrate the ability to preoerly identify, organize, plan, and allocate reources.
08. Discuss individual interests and aptitudes as they relate to a career.
09. Demonstrate employability skills.
10. Demonstrate an understanding of entrepreneurship.
11. Make an informed and meaningful career choice.

8600510 - TECHNOLOGY STUDIES I

12. Identify evolving technologies in our technological world.
13. Demonstrate knowledge of the basic principles of technology, the basic elements of all systems, and the components of each basic element.
14. Demonstrate knowledge and perform special skills unique to the physical technologies.
15. Demonstrate knowledge and perform special skills unique to the information/communication technologies.
16. Demonstrate knowledge and perform special skills unique to the biotechnologies.

8600540 - PRODUCTION TECHNOLOGY I

17. Identify kinds and levels of work common to production technology.
18. List requisites and career opportunities for employment in production technology.
19. Describe the processes related to industrial materials and composites.
20. Perform processing skills as it relates to industrial materials and composites.
21. Produce a custom product from industrial materials and composites using preprocessing, processing, and postprocessing production technology skills.

8600570 - ENGINEERING TECHNOLOGY I

22. Demonstrate and apply fluid system principles.
23. Demonstrate and apply thermal system principles.
24. Demonstrate and apply electrical system principles.
25. Demonstrate and apply mechanical system principles.
26. Communicate through oral, written or graphic means the results of solutions or designs.
27. Demonstrate graphical literacy and use of graphical representations in analysis and design.
28. Describe the legal, ethical, social and economic factors that influence engineering design.

STUDENT PERFORMANCE STANDARDS — EFFECTIVE DATE: July, 1992

PROGRAM AREA: Technology Education — SECONDARY NUMBER: 8600100

PROGRAM TITLE: Technology Applications I

PROGRAM DESCRIPTION:

This program provides students with an introduction to the knowledge, human relations, and technological skills found today in technical professions.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--
The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
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04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
  -integers, fractions, and decimals;
  -ratios, proportions, and percentages;
  -roots and powers;
  -algebra;
  -geometry.
04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry. (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.

05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "Brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--
The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--
The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--
The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--
The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--
The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

8600510 - TECHNOLOGY STUDIES I

12.0 IDENTIFY EVOLVING TECHNOLOGIES IN OUR TECHNOLOGICAL WORLD--
The student will be able to:

12.01 List five technologies that did not exist five years ago.
12.02 Use the problem-solving process to generate three potential improvements to a recent, or evolving technology.

13.0 DEMONSTRATE KNOWLEDGE OF THE BASIC PRINCIPLES OF TECHNOLOGY, THE BASIC ELEMENTS OF ALL SYSTEMS, AND THE COMPONENTS OF EACH BASIC ELEMENT--
The student will be able to:

13.01 Define the six basic principles of technology: force, work, rate, resistance, energy, and power.
13.02 Name and define the three basic elements of all systems.
13.03 Name components of the three basic elements of a system.
13.04 Name the six basic parts of the energy system.
13.05 State the function of each of the basic parts of the energy system.
13.06 Name and explain the functions of the four common working energy systems: mechanical, electrical, fluid, and thermal.

14.0 DEMONSTRATE KNOWLEDGE AND PERFORM SPECIAL SKILLS UNIQUE TO THE PHYSICAL TECHNOLOGIES--
The student will be able to:

14.01 Define the function of construction technology, energy and power technology, manufacturing technology, and transportation technology.
14.02 Describe three careers for each of the physical technologies identified in 14.01.
14.03 Identify and demonstrate the tools, processes, and materials used in construction technology.
14.04 Identify and demonstrate the equipment, processes, and materials used in energy and power technology for converting and transmitting power.
14.05 Identify and demonstrate the tools, processes, and materials used in manufacturing technology to perform computer-aided manufacturing.
14.06 Identify and demonstrate various ways that people and goods are transported.
14.07 Demonstrate problem-solving skills relative to the physical technologies utilizing the techniques learned in this course.

15.0 DEMONSTRATE KNOWLEDGE AND PERFORM SPECIAL SKILLS UNIQUE TO THE INFORMATION/COMMUNICATION TECHNOLOGIES--
The student will be able to:

15.01 Define the function of information processing technology, graphic communication technology, and electronic communication technology.
15.02 Describe three careers for each of the communications technologies identified in 15.01.
15.03 Identify and demonstrate the tools, processes and materials used in the information/communication technologies.
15.04 Compare and contrast different processes of communication

technologies.

15.05 Demonstrate modern communication systems using sound and speech, symbols and codes, printed words, drawing and pictures.

15.06 Identify the function of information processing technology, graphic communication technology, and electronic communication technology.

15.07 Identify several telecommunication services.

15.08 Demonstrate problem-solving skills relative to the information communication technologies utilizing the techniques learned in this course.

16.0 DEMONSTRATE KNOWLEDGE AND PERFORM SPECIAL SKILLS UNIQUE TO THE BIOTECHNOLOGIES--
The student will be able to:

16.01 Define the function of biotechnology, medical technology, food production technology, and agriculture technology.

16.02 Describe three careers for each of the technology areas in 16.01.

16.03 Explain the three areas into which modern biotechnology is divided.

16.04 Contrast the seven resources for biotechnology with other technologies.

16.05 Identify several impacts of biotechnology on society and the environment.

16.06 Identify the role of biotechnology in agriculture, food production, and medicine.

16.07 Identify and describe the processes used in biotechnology and the related areas of produce outputs.

16.08 Identify several outputs of biotechnology and their related biotechnologies.

16.09 Demonstrate problem solving skills relative to biotechnology, or a related biotechnology utilizing the techniques learned in this course.

8600540 - PRODUCTION TECHNOLOGY I

17.0 IDENTIFY KINDS AND LEVELS OF WORK COMMON TO PRODUCTION TECHNOLOGY--
The student will be able to:

17.01 Identify kinds of work related to materials and processes technologies.

17.02 Identify kinds of work related to manufacturing technologies.

17.03 Identify kinds of work related to construction technologies.

17.04 Identify semiskilled, skilled and professional levels of work in materials and processes technologies.

17.05 Identify semiskilled, skilled, and professional levels of work in manufacturing technologies.

17.06 Identify semiskilled, skilled, and professional levels of work in construction technologies.

18.0 LIST REQUISITES AND CAREER OPPORTUNITIES FOR EMPLOYMENT IN PRODUCTION TECHNOLOGY--
The student will be able to:

18.01 List occupations, job requirements, and employment opportunities in materials and processes, manufacturing construction technology.

18.02 List occupational training programs and academic programs and the postsecondary levels in production technology.

19.0 DESCRIBE THE PROCESSES RELATED TO INDUSTRIAL MATERIALS AND COMPOSITES--
The student will be able to:

19.01 Describe preprocessing functions.

19.02 Describe processing functions.

19.03 Describe postprocessing functions.

20.0 PERFORM PREPROCESSING SKILLS AS IT RELATES TO INDUSTRIAL MATERIALS AND COMPOSITES--
The student will be able to:

20.01 Design a product.
20.02 Prepare a product materials list.
20.03 Prepare a product production procedure list.
20.04 Locate and order products and materials.
20.05 Store and protect product materials properly.

21.0 PRODUCE A CUSTOM PRODUCT FROM INDUSTRIAL MATERIALS AND COMPOSITES USING PREPROCESSING, PROCESSING, AND POSTPROCESSING PRODUCTION TECHNOLOGY SKILLS--
The student will be able to:

21.01 Apply the technology processes of separating and forming materials.
21.02 Apply the technology processes of conditioning materials.
21.03 Apply the technology processes of combining in the fabrication and finishing of materials.
21.04 Apply modern production technology practices and equipment in the processes of separating, forming, conditioning, fabricating and finishing of materials (CNC, CAD, CAM, Robotics, etc.).
21.05 Assemble a product.

8600570 - ENGINEERING TECHNOLOGY I

22.0 DEMONSTRATE AND APPLY FLUID SYSTEM PRINCIPLES--
The student will be able to:

22.01 Assemble, operate, and identify the parts of a system which demonstrates fluid system principles.
22.02 Demonstrate and apply principles of force, work, rate, resistance, energy, power, and force transformers relating to fluid systems.

23.0 DEMONSTRATE AND APPLY THERMAL SYSTEM PRINCIPLES--
The student will be able to:

23.01 Assemble, operate, and identify the parts of a system which demonstrates thermal system principles.
23.02 Demonstrate and apply principles of force, work, rate, resistance, energy, power, and force transformers relating to thermal systems.

24.0 DEMONSTRATE AND APPLY ELECTRICAL SYSTEM PRINCIPLES--
The student will be able to:

24.01 Assemble, operate, and identify the parts of a system which demonstrates electrical system principles.
24.02 Demonstrate and apply principles of force, work, rate, resistance, energy, power, and force transformers relating to electrical systems.

25.0 DEMONSTRATE AND APPLY MECHANICAL SYSTEM PRINCIPLES--
The student will be able to:

25.01 Assemble, operate, and identify the parts of a system which demonstrates mechanical systems principles.
25.02 Demonstrate and apply principles of force, work, rate, resistance, energy, power, and force transformers relating to mechanical systems.

26.0 COMMUNICATE THROUGH ORAL, WRITTEN, OR GRAPHIC MEANS, THE RESULTS OF SOLUTIONS OR DESIGNS--
The student will be able to:

26.01 Understand and interpret basic engineering drawings.
26.02 Measure quantities and conduct basic tests according to published procedures.
26.03 Use precision measuring tools and instruments to layout, measure and inspect parts or articles.
26.04 Sketch objects using multi-view and pictorial principles.
26.05 Prepare drawings using basic technical drawing instruments for orthographic and isometric projections.
26.06 Use engineering design graphics and descriptive geometry in the solution of design problems.
26.07 Describe graphic communications principles.

27.0 DEMONSTRATE GRAPHICAL LITERACY AND THE USE OF GRAPHICAL REPRESENTATIONS IN ANALYSIS AND DESIGN--
The student will be able to:

27.01 Identify the basic tools and instruments for engineering design graphics.
27.02 Express knowledge and basic theory in engineering design graphics.
27.03 Make a technological decision relate to engineering design graphics.
27.04 Interpret engineering design graphics, using various systems of measurement.
27.05 Define and outline steps in the engineering design graphics process.
27.06 Describe the use of sketches and assembly drawings in the engineering design process.
27.07 Use engineering design graphics to describe the solution of an engineering problem.

28.0 DESCRIBE THE LEGAL ETHICAL SOCIAL, AND ECONOMIC FACTORS THAT INFLUENCE ENGINEERING DESIGN--
The student will be able to:

28.01 Discuss the legal constraints placed on the practice of engineering.
28.02 Discuss the underlying principles of professional ethics.
28.03 Discuss the underlying principles of business (i.e., industrial) ethics.
28.04 Describe how economics and resource availability can influence design.
28.05 Explain the need and use of design standards.
28.06 Describe the legal protection afforded and inventor or designer.

CURRICULUM FRAMEWORK PROGRAM AREA: Technology Education

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

PROGRAM TITLE: Technology Applications II

CODE NUMBER: Secondary 8600600 Postsecondary _______

Florida CIP 0821.011200

SECONDARY SCHOOL CREDITS 3 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ____

APPLICABLE LEVEL(S): _____7-9 X 9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational X Other 30, 31

CERTIFICATION COVERAGE: INDUS ARTS @ 4 @ 6
I ART-TEC 1 @2

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to provide students with a foundation of knowledge and technically oriented experiences in the study of the applications of technology and its effect upon our lives and the choosing of an occupation. The content and activities will also include the study of entrepreneurship, safety, and leadership skills.

Laboratory experiences revolve around the physical technologies of construction, energy and power, manufacturing, material processing and transportation; information/communication technologies of information processing, graphic communication and electronic communications; and biotechnologies in agriculture, health care and medicine.

The content includes intermediate studies in areas of technology which include Communications, Power and Transportation, Production, Drafting and Design, Electronics, and Engineering.

Listed below are the level II courses in the Technology Applications I thru III sequence offered at secondary schools followed by the proposed laboratory design codes appropriate for the courses as shown in DVACE joint Memorandum 92-37.

8600610	Technology Studies II (243)
8600640	Production Technology II (243)
8600670	Engineering Technology II (243)

II. LABORATORY ACTIVITIES: Instruction and learning activities are provided in a laboratory setting using hands-on experiences with technology equipment, tools and materials appropriate to the course content.

III. SPECIAL NOTE: The Florida Technology Student Association (FL-TSA) is the appropriate vocational student organization for providing leadership training experiences and for reinforcing specific technology skills. When provided, these activities are considered an integral part of this instructional program.

Please note that the courses listed in this program may articulate into postsecondary Tech-Prep 2 + 2 programs when combined with a corresponding course listed under TECHNOLOGY APPLICATIONS III. Tech-Prep 2 + 2 programs require articulation agreements between secondary and post-secondary educational agencies.

A proposed change to section 239.217 F.S., Florida Gold Seal Vocational Endorsement, would permit a student who "completed three credits in a sequential program of studies defined in an articulation agreement with a postsecondary institution(s) and leading to completion of a postsecondary job preparatory program as defined by 228.041 F.S." to participate in the Gold Seal Vocational Endorsement.

IV. **INTENDED OUTCOMES**: Outcomes 1 through 11 apply to each of the courses in this program. After successfully completing this course the student will be able to:

01. Demonstrate the ability to work safely with a variety of technologies.

02. Demonstrate interpersonal skills as they relate to the workplace.

03. Identify and apply methods of information acquisition and utilization.

04. Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.

05. Demonstrate and apply design/problem-solving processes.

06. Express an understanding of technological systems and their complex interrelationships.

07. Demonstrate the ability to preoerly identify, organize, plan, and allocate reources.

08. Discuss individual interests and aptitudes as they relate to a career.

09. Demonstrate employability skills.

10. Demonstrate an understanding of entrepreneurship.

11. Make an informed and meaningful career choice.

8600610 - TECHNOLOGY STUDIES II

12. Demonstrate knowledge of the basic principles of technology, the basic elements of all systems, and the components of each basic element.

13. Demonstrate knowledge and perform special skills unique to the physical technologies.

14. Demonstrate knowledge and perform special skills unique to the information/communication technologies.

15. Demonstrate knowledge and perform special skills unique to the biotechnologies.

16. Demonstrate knowledge and application of robotics technology.

17. Demonstrate knowledge and application of programmable controller technology.

18. Demonstrate the techniques of computer numerical control technology..

19. Demonstrate knowledge and application of computer aided drafting technology.

20. Demonstrate knowledge and application of laser technology.

8600640 - PRODUCTION TECHNOLOGY II

21. Plan and participate in a mass production system for manufacturing a product.

22. Perform the technological processes of separating and forming materials.

23. Utilize modern production technology in the processes of separating, forming, combining, fabrication and finishing of materials (CAM, CNC, Robotics, Work Cells).

24. Conduct a research and experimentation project on a production technology system.

8600670 - ENGINEERING TECHNOLOGY II

25. Discuss engineering technology careers and practices.

26. Demonstrate the engineering analysis and design methods.

27. Demonstrate the engineering design reporting process as a team effort and individually.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education SECONDARY NUMBER: 8600600

PROGRAM TITLE: Technology Applications II

PROGRAM DESCRIPTION:

This program provides students with an introduction to the knowledge, human relations, and technological skills found today in technical professions.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--
The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.

04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.

04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
  -integers, fractions, and decimals;
  -ratios, proportions, and percentages;
  -roots and powers;
  -algebra;
  -geometry.
04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry. (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.

05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "Brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--
The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--
The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--
The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--
The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--
The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

8600610 - TECHNOLOGY STUDIES II

12.0 DEMONSTRATE KNOWLEDGE OF THE BASIC PRINCIPLES OF TECHNOLOGY, THE BASIC ELEMENTS OF ALL SYSTEMS, AND THE COMPONENTS OF EACH BASIC ELEMENT--
The student will be able to:

12.01 Define the six basic principles of technology: force, work, rate, resistance, energy, and power.
12.02 Name and define the three basic elements of all systems.
12.03 Name components of the three basic elements of a systems.
12.04 Name the six basic parts of the energy system.
12.05 State the function of each of the basic parts of the energy system.
12.06 Name and explain the functions of the four common working energy systems: mechanical, electrical, fluid, and thermal.

13.0 DEMONSTRATE KNOWLEDGE AND PERFORM SPECIAL SKILLS UNIQUE TO THE PHYSICAL TECHNOLOGIES--
The student will be able to:

13.01 Define the function of construction technology, energy and power technology, manufacturing technology, and transportation technology.
13.02 Describe three careers for each of the physical technologies identified in 14.01.
13.03 Identify and demonstrate the tools, processes, and materials used in construction technology.
13.04 Identify and demonstrate the equipment, processes, and materials used in energy and power technology for converting and transmitting power.
13.05 Identify and demonstrate the tools, process, and materials used in manufacturing technology to perform computer-aided manufacturing.
13.06 Identify and demonstrate various ways that people and goods are transported.
13.07 Demonstrate problem-solving skills relative to the physical technologies utilizing the techniques learned in the course.

14.0 DEMONSTRATE KNOWLEDGE AND PERFORM SPECIAL SKILLS UNIQUE TO THE INFORMATION/COMMUNICATION TECHNOLOGIES--
The student will be able to:

14.01 Define the function of information processing technology, graphic communication technology, and electronic communication technology.
14.02 Describe three careers for each of the communications technologies identified in 15.01.
14.03 Identified and demonstrate the tools, processes and materials used in the information/communication technologies.
14.04 Compare and contrast different processes of communication technologies.
14.05 Demonstrate modern communication systems using sound and speech, symbols and codes, printed works, drawing and pictures.
14.06 Identify the function of information processing technology, graphic communication technology, and electronic communication technology.
14.07 Identify several telecommunication services.

14.08 Demonstrate problem-solving skills relative to the information communication technologies utilizing the techniques learned in this course.

15.0 DEMONSTRATE KNOWLEDGE AND PERFORM SPECIAL SKILLS UNIQUE TO THE BIOTECHNOLOGIES--
The student will be able to:

15.01 Define the function of biotechnology, medical technology, food production technology, and agriculture technology.
15.02 Describe three careers for each of the technology areas in 16.01.
15.03 Explain the three areas into which modern biotechnology is divided.
15.04 Contrast the seven resources for biotechnology with other technologies.
15.05 Identify several impacts of biotechnology on society and the environment.
15.06 Identify the role of biotechnology in agriculture, food production, and medicine.
15.07 Identify and describe the processes used in biotechnology and the related areas of produce outputs.
15.08 Identify several outputs of biotechnology and their related biotechnologies.
15.09 Demonstrate problem-solving skills relative to biotechnology, or a related biotechnology utilizing the techniques learned in this course.

16.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF ROBOTICS TECHNOLOGY--
The student will be able to:

16.01 Identify three types of robots.
16.02 State the function of effectors, sensors, controllers, and auxiliary parts in a robotics system.
16.03 Operate a robot using a teach pendant.
16.04 Program a robot using a computer to perform a specific task.
16.05 Explain three impacts of robotics on society.
16.06 Demonstrate problem-solving skills relative to robotics utilizing the techniques learned in this course.

17.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF PROGRAMMABLE CONTROLLER TECHNOLOGY--
The student will be able to:

17.01 State the function of the component parts of a programmable controller.
17.02 List several advantages of using programmable controllers.
17.03 Demonstrate logical continuity and branching functions with a programmable controller.

18.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF PROGRAMMABLE CONTROLLER TECHNOLOGY--
The student will be able to:

18.01 Demonstrate the technique of computer numerical control to perform and engraving and a milling activity.
18.02 Demonstrate problem-solving skills relative to computer numerical control utilizing the techniques learned in this course.

19.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF COMPUTER-AIDED DRAFTING TECHNOLOGY--
The student will be able to:

19.01 Compare and contrast computer-aided drafting with non-computer aided drafting in terms of speed consistency, neatness, and accuracy.
19.02 Demonstrate the application of a computer and software program indoing several computer-aided drawings.
19.03 Identify computer-aided drafting hardware.
19.04 Demonstrate program-solving skills relative to computer-aided drafting utilizing the techniques learned in this course.

20.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF LASER TECHNOLOGY--
The student will be able to:

20.01 Describe five applications of lasers.
20.02 Perform laser experiments demonstrating knowledge of:
    .01 Characteristics of laser light.
    .02 Characteristics of light waves.
20.03 List the safety precautions that one observes when working with a laser.
20.04 Assemble, operate and identify the parts of a laser optics system.
20.05 Demonstrate the use of a laser to do measurements, transmit data, and monitor.

8600640 - PRODUCTION TECHNOLOGY II

21.0 PLAN AND PARTICIPATE IN A MASS PRODUCTION SYSTEM FOR MANUFACTURING A PRODUCT--
The student will be able to:

21.01 Design jigs, fixtures, or a model system for product mass production.
21.02 Develop workable jigs, fixtures and/or a model system for product mass production.
21.03 Participate in the organized mass production of a product.
21.04 Demonstrate design/problem-solving processes.

22.0 PERFORM THE TECHNOLOGICAL PROCESSES OF SEPARATING AND FORMING MATERIALS-
The student will be able to:

22.01 Perform materials-forming practices such as casting or molding, and compressing or stretching.
22.02 Perform materials separating practices such as shearing, chip removing, and other separating processes.
22.03 Demonstrate design/problem-solving processes.

23.0 UTILIZE MODERN PRODUCTION TECHNOLOGY IN THE PROCESSES OF SEPARATING, FORMING, COMBINING, FABRICATION, AND FINISHING OF MATERIALS (CAM, CNC, Robotics, Work Cells)--
The student will be able to:

23.01 Design a program to be used in the separating forming and finishing of materials.
23.02 Develop and perform an operational program of forming materials.
23.03 Develop and perform an operational program of finishing materials.
23.04 Develop and perform an operational program that will use combination of production processes and materials.
23.05 Demonstrate design/problem-solving processes.

24.0 CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT ON A PRODUCTION TECHNOLOGY SYSTEM--
The student will be able to:

24.01 Identify a problem.
24.02 State a need to research the problem.
24.03 Form a hypothesis about the problem.

24.04 Plan the procedures for researching the problem.
24.05 Conduct the research following the planned procedures.
24.06 Present the research findings in a seminar.
24.07 State conclusions based on the research findings.

8600670 - ENGINEERING TECHNOLOGY II

25.0 DISCUSS ENGINEERING TECHNOLOGY CAREERS AND PRACTICES--
The student will be able to:

25.01 Summarize the professional characteristics of engineers.
25.02 List the principal fields for specialization in engineering.
25.03 Describe the procedures for becoming a registered engineer in Florida.
25.04 Describe the procedures for becoming a certified engineering technician.
25.05 Outline the typical steps to follow to prepare for a course of study leading to an engineering career.

26.0 DEMONSTRATE ENGINEERING ANALYSIS AND DESIGN METHODS--
The student will be able to:

26.01 Define the terms: analysis, design, and application.
26.02 Define the experimental method as it is applied to design.
26.03 Describe methodology.
26.04 Describe simulation.
26.05 Prepare a model of a design solution to an engineering problem.
26.06 Prepare a graphical solution to an engineering problem.
26.07 Prepare a mathematical solution to an engineering problem (using either a calculator or computer).

27.0 DEMONSTRATE THE ENGINEERING DESIGN REPORTING PROCESS AS A TEAM EFFORT AND INDIVIDUALLY--
The student will be able to:

27.01 Research an engineering acheivement and prepare a model, or display.
27.02 Deliver a short oral briefing which explains a technical device, process or achievement.
27.03 As a team, present a technical report on an engineering design problem, concept or issue.

CURRICULUM FRAMEWORK PROGRAM AREA: Technology Education
FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993
PROGRAM TITLE: Technology Applications III
CODE NUMBER: Secondary 8601700 Postsecondary ______
Florida CIP 0821.011300

SECONDARY SCHOOL CREDITS 3 COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ____

APPLICABLE LEVEL(S): _____ 7-9 X 9-12 _____ Postsecondary Adult Vocational
______ Postsecondary Vocational X Other 30, 31

CERTIFICATION COVERAGE: INDUS ARTS @ 4 @ 6
I ART-TEC 1 @2

I. MAJOR CONCEPTS/CONTENT: The purpose of this program is to provide students with a foundation of knowledge and technically oriented experiences in the study of the applications of technology and its effect upon our lives and the choosing of an occupation. The content and activities will also include the study of entrepreneurship, safety, and leadership skills.

The content includes advanced studies in areas of technology which include Communications, Power and Transportation, Production, Drafting and Design, Electronics, and Engineering.

Listed below are the level III courses in the Technology Applications I thru III sequence offered at secondary schools followed by the proposed laboratory design codes appropriate for the courses as shown in DVACE joint Memorandum 92-37.

8601710	Technology Studies III (243)
8601740	Production Technology III (243)
8601770	Engineering Technology III (243)

II. LABORATORY ACTIVITIES: Instruction and learning activities are provided in a laboratory setting using hands-on experiences with technology equipment, tools and materials appropriate to the course content.

III. SPECIAL NOTE: The Florida Technology Student Association (FL-TSA) is the appropriate vocational student organization for providing leadership training experiences and for reinforcing specific technology skills. When provided, these activities are considered an integral part of this instructional program.

Please note that the courses listed in this program may articulate into postsecondary Tech-Prep 2 + 2 programs when combined with a corresponding course listed under TECHNOLOGY APPLICATIONS II. Tech-Prep 2 + 2 programs require articulation agreements between secondary and post-secondary educational agencies.

A proposed change to section 239.217 F.S., Florida Gold Seal Vocational Endorsement, would permit a student who "completed three credits in a sequential program of studies defined in an articulation agreement with a postsecondary institution(s) and leading to completion of a postsecondary job preparatory program as defined by 228.041 F.S." to participate in the Gold Seal Vocational Endorsement.

IV. INTENDED OUTCOMES: Outcomes 1 through 11 apply to each of the courses in this program. After successfully completing this course the student will be able to:

01. Demonstrate the ability to work safely with a variety of technologies.
02. Demonstrate interpersonal skills as they relate to the workplace.
03. Identify and apply methods of information acquisition and utilization.
04. Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.
05. Demonstrate and apply design/problem-solving processes.
06. Express an understanding of technological systems and their complex interrelationships.
07. Demonstrate the ability to preoerly identify, organize, plan, and allocate reources.
08. Discuss individual interests and aptitudes as they relate to a career.
09. Demonstrate employability skills.
10. Demonstrate an understanding of entrepreneurship.
11. Make an informed and meaningful career choice.

8601710 - TECHNOLOGY STUDIES III

12. Demonstrate knowledge and application of mechanical systems.
13. Demonstrate knowledge and application of fluid systems.
14. Demonstrate knowledge and application of electrical systems.
15. Demonstrate the use of fiber optics.
16. Demonstrate the use of a computer to integrate and control a system composed of mechanical, fluid and electrical systems.
17. Conduct a research and experimentation project on a technological material or process.

8601740 - PRODUCTION TECHNOLOGY III

18. Demonstrate technological knowledge and skills in the designing and engineering of constructed works.
19. Demonstrate technical knowledge and skills in the contracting, estimating, bidding, and scheduling procedures processes.
20. Demonstrate technical knowledge and skill in the construction of superstructures.
21. Demonstrate technical knowledge and skills in the installation of utilities.
22. Demonstrate technical knowledge and skills in the processes of enclosing superstructures.
23. Demonstrate technical knowledge and skills in the process of finishing the interior and exterior of a constructed structure.
24. Conduct a research and experimentation project on a production technology system.

8601770 - ENGINEERING TECHNOLOGY III

25. Demonstrate and apply mechanical, fluid, electrical and thermal system principles.
26. Demonstrate a knowledge of materials and processes.
27. Use tools, machines, calculators, and computers necessary for obtaining solutions to design problems.
28. Describe the functional characteristics of the engineering design team.
29. Conduct a research and experimentation or design project on engineering technology.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education SECONDARY NUMBER: 8601700

PROGRAM TITLE: Technology Applications III

PROGRAM DESCRIPTION:

This program provides students with an introduction to the knowledge, human relations, and technological skills found today in technical profession.

01.0 DEMONSTRATE THE ABILITY TO WORK SAFELY WITH A VARIETY OF TECHNOLOGIES--The student will be able to:

01.01 Select appropriate tools, procedures, and/or equipment needed to produce a product.
01.02 Demonstrate the safe usage of appropriate tools, procedures, and operation of equipment needed to produce a product.
01.03 Demonstrate knowledge required to maintain and troubleshoot equipment used in a variety of technological systems.
01.04 Follow laboratory safety rules and procedures.
01.05 Demonstrate good housekeeping at work station within total laboratory.
01.06 Identify color-coding safety standards.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 DEMONSTRATE INTERPERSONAL SKILLS AS THEY RELATE TO THE WORKPLACE--The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Participate as a member of a team.
02.03 Teach others new skills.
02.04 Identify skills needed to serve clients/customers.
02.05 Demonstrate leadership skills.
02.06 Describe strategies necessary for negotiating agreements.
02.07 Demonstrate the application of skills necessary to work with people of diverse backgrounds.
02.08 Form an understanding and appreciation for work after listening to or observing technology workers.
02.09 Form an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
02.10 Form an understanding and appreciation for the roles and work of co-workers.

03.0 IDENTIFY AND APPLY METHODS OF INFORMATION ACQUISITION AND UTILIZATIONS--The student will be able to:

03.01 Define terms related to computers.
03.02 Identify and describe methods of information acquisition and evalution.
03.03 Discuss advantages and disadvantages in the application of technologies.
03.04 Produce a plan to organize and maintain information relevant to emerging technologies.
03.05 Comprehend and communicate information relevant to emerging technologies.
03.06 Demonstrate the use of computers to process information.

04.0 APPLY BASIC SKILLS IN COMMUNICATIONS, MATHEMATICS, AND SCIENCE APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--

The student will be able to:

04.01 Identify and explain the main and subordinate ideas in a written work.
04.02 Distinguish different purposes and methods of writing, identify a writer's point of view and tone, and interpret a writer's meaning.
04.03 Define unfamiliar words by use of structural analysis, decoding, contextual clues, or by using a dictionary.
04.04 Distinguish fact from opinion.
04.05 Read critically by asking pertinent questions, by recognizing assumptions and implications, and by evaluating ideas.
04.06 Select, relate, and organize, ideas using outlining and/or graphic organizers and develop the ideas in coherent paragraphs.
04.07 Improve one's own writing by restructuring, correcting errors, and rewriting.
04.08 Gather and organize information from primary and secondary sources; write a report using this research; quote, paraphrase, and summarize accurately; and cite sources properly.

04.09 Vary one's writing style, including vocabulary and sentence structure, for different readers and purposes.

04.10 Write logical and understandable statements, or phrases, to accurately fill out commonly used forms.
04.11 Compose unified and coherent correspondence, directions, descriptions, explanations and reports.
04.12 Participate critically and constructively in the exchange of ideas, particularly during class discussions and conferences with instructors.
04.13 Conceive and develop ideas about a topic for the purpose of speaking to a group; choose and organize related ideas; present them clearly in Standard English; and evaluate similar presentations by others.
04.14 Use the mathematics of:
  -integers, fractions, and decimals;
  -ratios, proportions, and percentages;
  -roots and powers;
  -algebra;
  -geometry.
04.15 Make estimates and approximations, and judge the reasonableness of a result.
04.16 Use elementary concepts of probability and statistics.
04.17 Draw, read, and analyze graphs, charts, and tables.
04.18 Ask appropriate scientific questions and recognize what is involved in experimental approaches to the solutions of such questions through familiarity with laboratory and field work.
04.19 Organize and communicate the results obtained by observation and experimentation.
04.20 Apply the basic principles of biology, physics, and chemistry. (properties of matter; structure of compounds; concepts of motion; temperature, pressure and volume; work, power, force and energy; machines; human cell structure).
04.21 Identify problems rooted in basic biology, physics, or chemistry (effects of hazardous materials on health and safety, effects of drugs on health, trouble shooting problems on a machine).

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--

The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.

05.04 Document each step of the design/problem-solving process.
05.05 Demonstrate "Brainstorming" as a process to solve problems.
05.06 Define "critical thinking" and its value in the problem-solving process.

06.0 EXPRESS AN UNDERSTANDING OF TECHNOLOGICAL SYSTEMS AND THEIR COMPLEX INTERRELATIONSHIPS--
The student will be able to:

06.01 Demonstrate a knowledge of how social, organizational, and technological systems work.
06.02 Explore methods used to monitor and correct performance of technological systems.
06.03 Design and implement an optimal solution to a given problem.
06.04 Outline major historical technological developments or events.
06.05 Identify recent advances in technology.
06.06 Explain problem-solving roles of technology.
06.07 Forecast a technological development or event.
06.08 Define technology.

07.0 DEMONSTRATE THE ABILITY TO PROPERLY IDENTIFY, ORGANIZE, PLAN, AND ALLOCATE RESOURCES--
The student will be able to:

07.01 Demonstrate the ability to select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
07.02 Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
07.03 Demonstrate the ability to acquire, store, allocate, and use materials or space efficiently.
07.04 Display a knowledge of the efficient use of human resources.

08.0 DISCUSS INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 DEMONSTRATE EMPLOYABILITY SKILLS--
The student will be able to:

09.01 Conduct a job search.
09.02 Secure information about a career.
09.03 Identify documents which may be required when applying for a job interview.
09.04 Complete a job application form correctly.
09.05 Demonstrate competence in job interview techniques.
09.06 Prepare a resume for a job.

10.0 DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP--
The student will be able to:

10.01 Define entrepreneurship.
10.02 Describe the importance of entrepreneurship to the American economy.
10.03 List the advantages and disadvantages of business ownership.
10.04 Identify the risks involved in ownership of a business.
10.05 Identify the necessary personal characteristics of a successful entrepreneur.
10.06 Identify the business skills needed to operate a small business efficiently and effectively.

11.0 MAKE AN INFORMED AND MEANINGFUL CAREER CHOICE--
The student will be able to:

11.01 Make a tentative occupational choice based on the information learned and interest developed in this course.
11.02 Review tentative occupational choices based on the information learned and interest developed in this course.

8601710 - TECHNOLOGY STUDIES III

12.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF MECHANICAL SYSTEMS--
The student will be able to:

12.01 Define the concepts of force, work, rate, resistance, energy and power as they relate to mechanical systems.
12.02 Diagram a mechanical system incorporating input, monitoring, controlling, output, and feedback.
12.03 Report on the six simple machines.
12.04 Identify various parts of a mechanical system.
12.05 Assemble and operate the six simple machines.
12.06 Use the problem-solving model--perform activities using combinations of the six simple machines to meet the described design criteria.
12.07 Demonstrate the use of a computer to control a mechanical system.

13.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF FLUID SYSTEMS--
The student will be able to:

13.01 Define the concepts of force, work rate, resistance, energy and power as they relate to fluid systems.
13.02 Diagram a fluid system incorporating input, monitoring, controlling, output, and feedback.
13.03 Diagram a fluid power system incorporating input, monitoring, controlling, output, and feedback.
13.04 Use the problem-solving model--perform activities using fluid power components to meet the described design criteria.
13.05 Assemble, operate, and identify the parts of a fluid power system.
13.06 Report on the applications of fluid power used in technology.
13.07 Demonstrate the use of a computer to control a fluid power system.

14.0 DEMONSTRATE KNOWLEDGE AND APPLICATION OF ELECTRICAL SYSTEMS--
The student will be able to:

14.01 Define the concepts of force, work, rate resistance, energy, and power as they relate to electrical systems.
14.02 Diagram an electrical system incorporating input, monitoring, controlling, output and feedback components.
14.03 Explain what a system and sub-system is.
14.04 Describe types of electrical outputs of heat, light, temperature, sound, magnetism, and electrical voltage.
14.05 Describe types of electrical inputs of light, temperature, sound, magnetism, moisture, movement, pressure, and voltage.
14.06 Use the problem-solving model--perform activities using electrical system components to meet the describe design criteria.
14.07 Demonstrate the use of a computer to control an electrical system.

15.0 DEMONSTRATE THE USE OF FIBER OPTICS--
The student will be able to:

15.01 Report on the applications of fiber optics in technology.
15.02 Use the problem-solving model--perform activities using fiber optics to meet the described design criteria.
15.03 Assemble, operate, and identify the parts of a fiber optics systems.

16.0 DEMONSTRATE THE USE OF A COMPUTER TO INTEGRATE AND CONTROL A SYSTEM COMPOSED OF MECHANICAL, FLUID AND ELECTRICAL SYSTEMS--
The student will be able to:

16.01 Diagram an integrated system incorporating input, monitoring, controlling, output and feedback components.
16.02 Use the problem-solving model--perform activities using integrated systems to meet the described design criteria.
16.03 Assemble, operate, and identify the parts of integrated systems.
16.04 Demonstrate the use of a computer to control an integrated system composed of mechanical, fluid and electrical components.

17.0 CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT ON A TECHNOLOGICAL MATERIAL OR PROCESS--
The student will be able to:

17.01 Identify a problem.
17.02 State a need to research the problem.
17.03 Form a hypothesis about the problem.
17.04 Plan the procedures for researching the problem.
17.05 Conduct the research following the planned procedures.
17.06 Present the research findings in a seminar.
17.07 State conclusions based on the research findings.

8601740 - PRODUCTION TECHNOLOGY III

18.0 DEMONSTRATE TECHNOLOGICAL KNOWLEDGE AND SKILLS IN THE DESIGNING AND ENGINEERING OF CONSTRUCTED WORKS--
The student will be able to:

18.01 Read and interpret architectural drawings, blueprints, symbols, and construction plans.
18.02 Describe building codes, permits, and inspection requirements.
18.03 Sketch and draw a plan for a construction project.
18.04 Display knowledge about regional planning and the construction of civil and community projects (roads, parks, dams, airports, seaports, warehouses, shopping centers, factories, skyscrapers, etc.).
18.05 Develop a scale model of a civil or community structure and give a report on the need.

19.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN THE CONTRACTING, ESTIMATING, BIDDING, AND SCHEDULING PROCEDURES PROCESSES--
The student will be able to:

19.01 Estimate construction costs using various methods including a computer.
19.02 Read and prepare bid invitations for contractors to build a construction project.
19.03 Establish criteria for awarding a construction contract.
19.04 Describe the content of a construction contract and performance bond.

20.0 DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN THE CONSTRUCTION OF SUPERSTRUCTURES--
The student will be able to:

20.01 Describe mass, solid wall, frame, and air-supported superstructures.
20.02 Describe the materials used in the construction of superstructures.
20.03 Use technical carpentry skills, tools, and materials in constructing a wood frame superstructure.
20.04 Describe factory manufacturing of superstructures and modules.

21.0 **DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN THE INSTALLATION OF UTILITIES**--
The student will be able to:

21.01 Describe public utility systems for supplying water, electricity, natural gas, and sewerage.
21.02 Describe the functions and operation of heating, cooling, and ventilating systems.
21.03 Demonstration a technical knowledge of plumbing and electrical systems in homes or buildings.
21.04 Use the technical tools and skills to install plumbing and electrical systems in homes of buildings.
21.05 Diagnose and troubleshoot problems with utility systems.

22.0 **DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN THE PROCESS OF ENCLOSING SUPERSTRUCTURES**--
The student will be able to:

22.01 Describe the different types of materials and methods for constructing interior and exterior walls.
22.02 Describe the different types of materials and methods for laying floors and building roofs.
22.03 Describe the different types of methods of constructing or installing windows and doors.
22.04 Describe the purposes, materials, and methods of insulating enclosed superstructures.

23.0 **DEMONSTRATE TECHNICAL KNOWLEDGE AND SKILLS IN THE PROCESS OF FINISHING THE INTERIOR AND EXTERIOR OF A CONSTRUCTED STRUCTURE**--
The student will be able to:

23.01 Describe the different types of materials and methods for trimming, painting, and decorating a constructed structure.
23.02 Describe the types of accessories and fixtures that are installed to finish completed construction.
23.03 Describe the materials and methods used for the finishing processes of paving and landscaping.

24.0 **CONDUCT A RESEARCH AND EXPERIMENTATION PROJECT ON A PRODUCTION TECHNOLOGY SYSTEM**--
The student will be able to:

24.01 Identify a problem.
24.02 State a need to research the problem.
24.03 Form a hypothesis about the problem.
24.04 Plan the procedures for researching the problem.
24.05 Conduct the research following the planned procedures.
24.06 Present the research findings in a seminar.
24.07 State conclusions based on the research findings.

8601770 - ENGINEERING TECHNOLOGY III

25.0 **DEMONSTRATE AND APPLY MECHANICAL, FLUID, ELECTRICAL AND THERMAL SYSTEM PRINCIPLES**--
The student will be able to:

25.01 Demonstrate the design solution to a mechanical system problem.
25.02 Demonstrate the design solution to a fluid system problem.
25.03 Demonstrate the design solution to an electrical system problem.
25.04 Demonstrate the design solution to a thermal system problem.
25.05 Select materials and processes to satisfy specific design criteria.
25.06 Select a problem or product for improvement using the design methodology.

26.0 DEMONSTRATE A KNOWLEDGE OF MATERIALS AND PROCESSES--
The student will be able to:

26.01 Describe the physical and chemical properties of engineering materials in terms of their structure.
26.02 List the causes of failure in materials and give procedures to prevent such failure.
26.03 Experiment with processes used with metal, woods, polymers, composite materials and adhesives.

27.0 USE TOOLS, MACHINES, CALCULATORS, AND COMPUTERS NECESSARY FOR OBTAINING SOLUTIONS TO DESIGN PROBLEMS--
The student will be able to:

27.01 Demonstrate the use of various graphs to categorize and display data.
27.02 Make decisions using graphical data presentations.
27.03 Demonstrate the use of a nomograph in solving equations.
27.04 Use a numerical calculator to solve complex equations either by direct solution or iteration (trial and error).
27.05 Use a computer and applications software to solve a design problem by simulation.
27.06 Demonstrate graphical vector analysis.

28.0 DESCRIBE THE FUNCTIONAL CHARACTERISTICS OF THE ENGINEERING DESIGN TEAM--
The student will be able to:

28.01 Describe work breakdown organization.
28.02 Describe work group organization schemes including functional and hierarchical schemes.
28.03 Describe the function of management in general and project management in particular.
28.04 Describe a typical design project team structure.
28.05 Outline a research methodology.
28.06 Describe brain-storming.

29.0 CONDUCT A RESEARCH AND EXPERIMENTATION OR DESIGN PROJECT ON ENGINEERING TECHNOLOGY--
The student will be able to:

29.01 Identify a problem.
29.02 State a need to solve the problem.
29.03 Form a hypothesis about the problem.
29.04 Plan the procedures for solving the problem.
29.05 Complete the solution following the planned procedures.
29.06 Present the findings in a seminar.
29.07 State conclusions based on the findings.

CURRICULUM FRAMEWORK PROGRAM AREA: Technology Education

FLORIDA DEPARTMENT OF EDUCATION EFFECTIVE DATE: July, 1993

COURSE TITLE: ESE-Technology Education for Exceptional Students

CODE NUMBER: Secondary 7980190 Postsecondary ______

Florida CIP 0821.1002ES

SECONDARY SCHOOL CREDITS Multiple COLLEGE CREDITS ______ POSTSECONDARY ADULT VOCATIONAL CREDITS ______

APPLICABLE LEVEL(S): ____6-9 _____9-12 _____Postsecondary Adult Vocational

______ Postsecondary Vocational ___Other Multiple

CERTIFICATION COVERAGE: INDUS ARTS @ 4 @ 6
I ART-TEC 1 @2

I. MAJOR CONCEPTS/CONTENT: This course is designed to provide with disabilities students with technological literacy and a foundation of knowledge and basic skills related to technology.

The content may include, but is not limited to: Integrated Technology Studies, Technology Systems, and Technology Applications.

II. LABORATORY ACTIVITIES: Instruction and learning activities are provided in a laboratory setting using hands-on exploratory experiences with the tools and materials appropriate to the course content.

III. SPECIAL NOTE: The Florida Technology Student Association (FL-TSA) is the appropriate student organization for providing leadership training experiences and for reinforcing specific technology skills. When provided, these activities are considered an integral part of this instructional course.

This entire course is not intended to be mastered in one year. A student may earn multiple credits in this course. Multiple credits may be earned sequentially or simultaneously. All student performance standards for this course might not be mastered in one year: therefore, the particular outcomes and student performance standards which the student must master to earn each credit must be specified in the student's individual educational plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in a subsequent IEP.

Proposed design code 240 as shown in DVACE joint Memorandum 92-37 of May 27, 1992, is appropriate for this course.

IV. INTENDED OUTCOMES: After successfully completing this course, the student will be able to:

01. Demonstrate proper and safe procedures while working with technological tools, apparatus, equipment, systems, and materials.
02. Exhibit positive human relations and leadership skills.
03. Demonstrate computer application and literacy.
04. Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.
05. Demonstrate and apply design/problem-solving processes.
06. Demonstrate technological literacy.
07. Display an understanding and appreciation for the dignity and worth of honest labor.

08. Identify individual interests and aptitudes as they relate to a career.

09. Utilize tools, machines, and equipment in the technology laboratory.

10. Identify kinds and levels of work common to technology.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July, 1993

PROGRAM AREA: Technology Education SECONDARY NUMBER: 7980190

COURSE TITLE: ESE-Technology Education for Exceptional Students

01.0 DEMONSTRATE PROPER AND SAFE PROCEDURES WHILE WORKING WITH TECHNOLOGICAL TOOLS, APPARATUS, EQUIPMENT, SYSTEMS, AND MATERIALS--
The student will be able to:

01.01 Follow laboratory safety rules and procedures.
01.02 Demonstrate good housekeeping at work station within total laboratory.
01.03 Conduct laboratory activities and equipment operations in a safe manner.
01.04 Exercise care and respect for all tools, equipment, and materials.
01.05 Identify color-coding safety standards.
01.06 Safely use hand tools and power equipment.
01.07 Explain fire prevention and safety precautions and practices for extinguishing fires.
01.08 Identify harmful effects/potential dangers of familiar hazardous substances/devices to people and the environment.

02.0 EXHIBIT POSITIVE HUMAN RELATIONS AND LEADERSHIP SKILLS--
The student will be able to:

02.01 Perform roles in a student personnel system or in the Florida Technology Student Association (FL-TSA).
02.02 Work cooperatively with others.

03.0 DEMONSTRATE COMPUTER APPLICATION AND LITERACY--
The student will be able to:

03.01 Define terms related to computer parts usage.
03.02 List ways in which computers are used in technology.
03.03 Discuss advantages and disadvantages in the use of computers.
03.04 Demonstrate the application of a computer.

04.0 APPLY BASIC SKILLS IN ENGLISH, MATHEMATICS, SCIENCE, AND SOCIAL STUDIES APPROPRIATE TO TECHNOLOGICAL CONTENT AND LEARNING ACTIVITIES--
The student will be able to:

04.01 Apply basic English skills while participating in technological assignments.
04.02 Apply basic mathematical skills while participating in technological assignments.
04.03 Apply basic science princp;es, theories, and laws while particpating in technological assignments.
04.04 Apply basic social studies principles while participating in technological assignments.

05.0 DEMONSTRATE AND APPLY DESIGN/PROBLEM-SOLVING PROCESSES--
The student will be able to:

05.01 Describe and explain steps in the design/problem-solving process.
05.02 Propose solutions to given problems.
05.03 Design and implement the optimal solution to a given problem.

06.0 DEMONSTRATE TECHNOLOGICAL LITERACY -
The student will be able to:

06.01 Outline major historical technological developments or events.
06.02 Identify recent advances in technology.
06.03 Explain problem-solving roles of technology.

06.04 Make a technological decision.
06.05 Define technology.

07.0 DISPLAY AN UNDERSTANDING AND APPRECIATION FOR THE DIGNITY AND WORTH OF HONEST LABOR--
The student will be able to:

07.01 Demonstrate an understanding and appreciation for work after listening to or observing technology workers.
07.02 Demonstrate an understanding and appreciation for work after participating in a simulated technology group project in the laboratory.
07.03 Demonstrate an understanding and appreciation for the roles and work of co-workers.

08.0 IDENTIFY INDIVIDUAL INTERESTS AND APTITUDES AS THEY RELATE TO A CAREER--
The student will be able to:

08.01 Describe individual strengths and weaknesses.
08.02 Discuss individual interests related to a career.
08.03 Identify careers within specific areas of technology.
08.04 Explore careers within specific areas of interest.

09.0 UTILIZE TOOLS, MACHINES, AND EQUIPMENT IN THE TECHNOLOGY LABORATORY--
The student will be able to:

13.01 Identify tools, machines, materials and equipment and describe their functions.
13.02 Select appropriate tools, machines, and equipment to accomplish a given task.
13.03 Demonstrate safe and correct use of tools, machines, and equipment.

10.0 IDENTIFY KINDS AND LEVELS OF WORK COMMON TO TECHNOLOGY--
The student will be able to:

10.01 Identify kinds of work related to technology.
10.02 Identify semiskilled, skilled, and professional levels of work in technology.

FLORIDA DEPARTMENT OF
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